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ABSTRACT

Examined was the relative effectiveness of four Ontario programs in integrating 195 hearing impaired elementary and secondary students into regular classrooms. Ss in settings classified as full integration, integration with itinerant help, partial integration, and partial segregation were given tests of hearing threshold, aural and oral functioning, intelligence, achievement, self concept, and speech intelligibility. Teachers were asked to provide data in six areas, including the student's social adjustment in school and the teacher's knowledge of hearing impairment, and parents were interviewed about such aspects as the child's hearing aid use at home. Ss in different programs were found to differ in terms of hearing level; there was a general decrease in hearing level from settings of more to less integration. Among other findings were that regular teachers who were in contact with an itinerant teacher knew more about hearing problems than those who were not; that Ss who were fully integrated has higher reading, language, and speech intelligibility scores than elementary segregated or secondary partially integrated Ss; that fully integrated Ss at the elementary level were better adjusted than Ss in itinerant-integration settings, while the self concept of itinerant-integrated and fully integrated secondary Ss declined the longer they were integrated. A comparison of successful and unsuccessful Ss was used to develop guidelines for integrating into regular classroom students with moderate and severe hearing losses. (CL)

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THE INTEGRATION OF HEARING IMPAIRED CHILDREN IN REGULAR CLASSROOMS

Carol Reich
Donald Hambleton
Barbara Klein

#142

August, 1975

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None of us are specialists in hearing impairment. To the extent, therefore, that this study answers some relevant questions, it is because the people we talked to who are working in the area set us on the right track. Any flaws in the study are, of course, our responsibility, and are due to our failure to listen to them hard enough.

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The Authors

A NOTE TO THE READER

This report is organized in the following manner. Chapter I is a general discussion of the various types of integration programmes, as well as previous empirical studies on the success of hearing impaired children in regular classrooms. It is a general introduction to the topic, but it need not be read in order to understand subsequent chapters.

The report of the present research really begins in Chapter II, which describes the programmes that were investigated and the subjects that were included in the present study. Chapter III describes the types of data that were collected.

Chapters IV, V, VI and VII present results of the study. Chapter IV describes differences among the groups of students who were found in the various programmes. Chapter V presents some data on the operation of the programmes themselves. These two chapters give a background for interpreting the differences in achievement shown by various groups of students.

Taking these differences into account, Chapter VI attempts to determine the relative success of the various programmes. Chapter VII then discusses, programme by programme, what types of students have been successfully integrated with a view to developing criteria for placing children in integrated settings. This chapter also looks at two groups of severely and profoundly deaf children who have been successfully integrated, after which the criteria that were developed are reconsidered. Chapter VII closes with a series of recommendations.

Each of Chapters I through VII ends with a summary of the material presented in that chapter. Readers might first wish to read these summary sections in order to develop an overview of the entire report, and only then read those chapters in detail which are of particular interest. It is expected, however, that all readers with more than a casual interest in the topic will read Chapters VI and VII in detail since the real meat of the study lies here. However, the rest of the chapters may be adequately covered by their summaries.

Finally, Chapter VIII is a type of general statement about the integration of hearing impaired children. It is based on the research reported here, but it does not discuss any of the results in detail. This chapter is meant to stand alone as an introduction and as a guide to educators, parents and other professionals who are interested in the possibilities of integration.

I -- INTRODUCTION

Models of Integration

When school systems first began providing for handicapped children, the usual approach was to offer special programmes in segregated classrooms or schools. However, in recent years this strategy has come under attack, and there is now an increasing emphasis on integrating children with various handicaps back into the mainstream of education. "Normalization," or "integration," or "mainstreaming" are terms used to describe integrating activities of various types.

Traditionally, severely and profoundly deaf children have also been educated in segregated facilities. In fact, schools for the deaf are among the earliest facilities for the exceptional child. In Ontario, the school at Belleville (now the Sir John Whitney School) was founded over a hundred years ago. Classes for hard of hearing children are also in existence. But hearing impaired children too, both deaf and hard of hearing, are being integrated in increasing numbers (Jones & Murphy, 1972).

Several arguments are advanced for integrating children in general, and the hearing impaired child in particular. First of all, there is the feeling that handicapped children will benefit academically from a regular environment in which the teacher has "normal" expectations of performance, and in which non-handicapped children provide "normal" intellectual stimulation and standards of achievement (Calvert & Ross, 1973). Second, the regular classroom provides a normal social environment. Hearing impaired children have been found to be retarded socially, and there is some evidence that social retardation increases with the degree of segregation from regular life (Quarrington & Solomon, 1975). Finally, contact with normal children provides a normal language environment, and is believed to stimulate the development of oral skills (Perier, 1972a and McGee, 1970).

This line of argument generally arises out of a concern for severely and profoundly deaf children. These are the ones who have traditionally been segregated from the normal school environment. However, integration is not a new concept for children with lesser degrees

of impairment. Children with mild to moderate losses have often been integrated, sometimes because their handicap was not considered severe enough to warrant special placement, sometimes because the handicap was not recognized.

However, there is increasing evidence that even children with mild losses may suffer educational deficiencies. Quigley (n.d.) investigated the situation of a group of children identified as having a hearing loss through audiometric screening. Eighty-three per cent (83%) of the group had losses of only 26 db or less, yet the group as a whole was somewhat behind in their educational achievement. Fisher (1971) reviews several studies which have similar findings.

Thus from one quarter there is increasing interest in integrating the hearing impaired child. From another there is growing concern about the status of hearing impaired children who have been integrated in the past, and about the conditions that must exist in order for integration to be successful.

The term of reference for the present study is the hard of hearing as opposed to the deaf child, although as will be seen, a few children with severe and profound losses were included in the sample. The literature is now replete with descriptions of various integration programmes for hard of hearing and deaf children, all somewhat different. In reading through this material, it became apparent that they differed from one another on a variety of dimensions. We identified eight such dimensions, and we feel that it is important to know how a programme stands on each one of these. Not all of the published descriptions are complete when considered from within this framework.

The first dimension is the level at which integration occurs. Integration can involve preschoolers, elementary children, or students at the secondary and post-secondary level. This study is concerned only with the middle two -- elementary and secondary (see Figure 1).

The second dimension is the degree of integration itself, and this refers to the amount of time that a child spends in contact with hearing peers. At the one extreme is complete segregation, such as one finds when a child attends a special school which is unattached to any regular school. Next is partial segregation, where the child's

main attachment is to a special school or unit, but in which he or she spends some time with regular students. The next level is partial integration. Here the child's main attachment is to a regular class, but some specialized help is provided in a group setting outside of that class. Finally, there is full integration in which the child's only association is with normally hearing peers in a regular school or class.

Assuming that there is some integration, the third dimension is the range over which it occurs. In some cases, the range is purely social. Here, contact between hearing impaired and normally hearing children only occurs outside of the classroom. It is usually of an informal nature, restricted to recess, the lunchroom and the schoolbus. The next level is integration for practical subjects such as home economics, shop, or physical education. In such cases social integration would usually also occur. Finally, there is academic integration in which the child takes his or her main academic work with hearing peers. Academic integration would usually also subsume the other two types.

Integration programmes can also be described in terms of whether the child is integrated individually or with a group. This is the unit of integration.

All integration programmes recognize the importance of special resource personnel. However, the type and manner in which special resources are provided also differ from programme to programme. The first dimension is specialization. In some cases trained teachers (specialists) of the hearing impaired are provided, and in others the only ancillary professionals available are those which are also available to any child in difficulty -- psychologists, tutors, social workers, speech therapists, etc. (generalists).

The provision of special resources of a specialized nature differs in its availability. In some cases, special services are episodic, provided to the child or teacher only when there is special cause for concern, as for example when the child is first integrated or when a teacher recognizes a specific problem. Some resources, however, are periodic and are available to the teacher and/or child on a regular basis. The frequency of periodic contact may vary. There may only be a brief, yearly checkup on the child's progress, or the child may

receive special tutoring several times a week. But whatever the frequency, periodic contact differs from the third condition, in which a special resource person is continually present within the school. Contact between the specialist and regular teachers may or may not be of a formal nature, but the specialist in hearing impairment is continually available for consultation or tutoring.

All three levels of availability may differ in their focus. For some, the major activity of the specialist is helping the regular teacher to better understand and plan for the hearing impaired child in the class. In some cases, the major focus is on helping the child directly. Of course, some programmes provide both types of services.

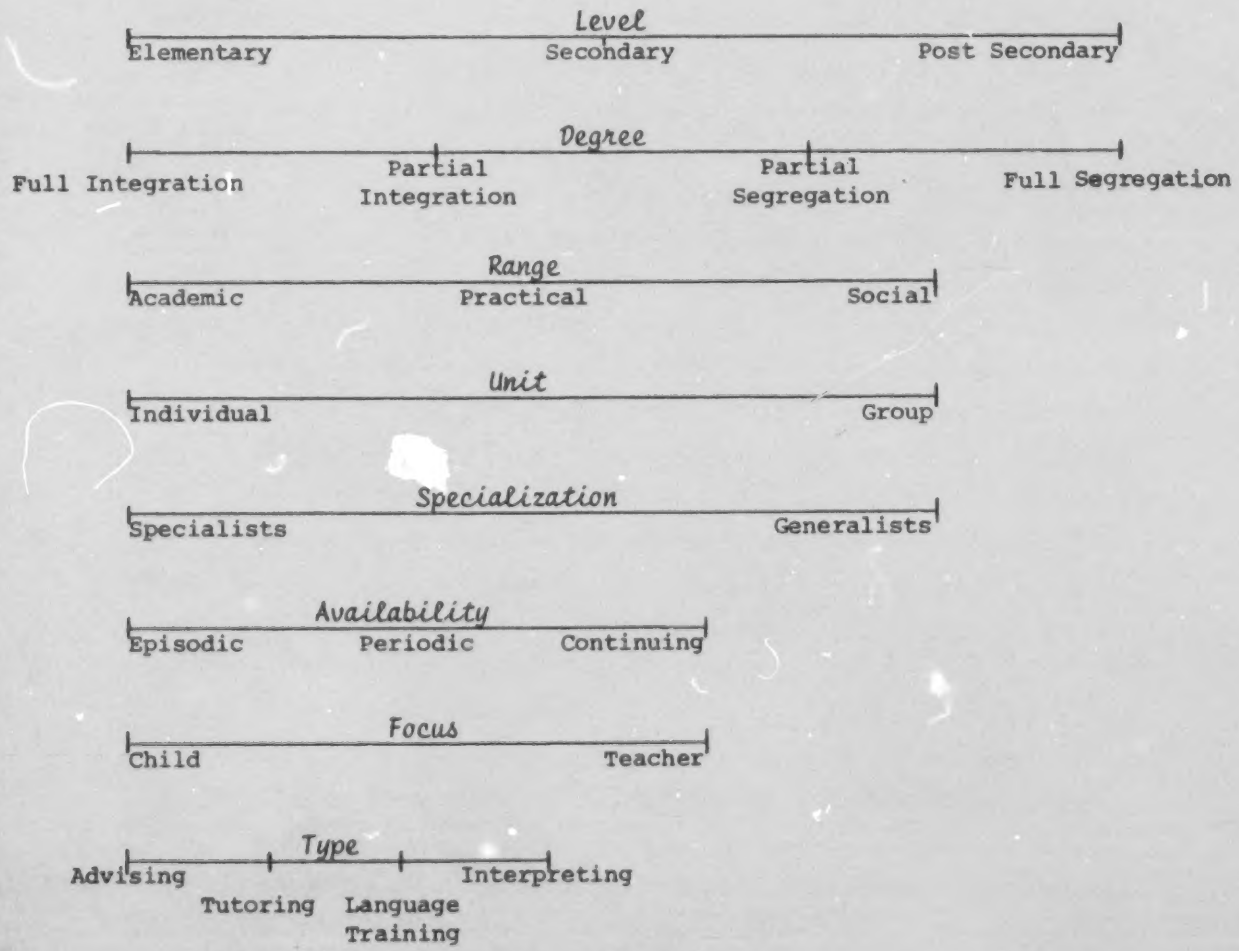

Figure 1. Dimensions of Integration

If the focus of help is the child, the service may be of several types -- advising, tutoring, language training, or interpreting. The first of these, "advising," is similar to the role a specialist may play in helping the regular teachers cope with a hearing impaired child, except that the situation is reversed. In giving counsel and encouragement, the child is helped to cope with the teacher and the regular class. "Tutoring" is giving the child additional help in specific subjects.

These two types of special services to the child are not new, and they may be useful to any handicapped child. The last two, however, do represent an innovation, and they are services of particular usefulness to the child who is hearing impaired. "Language training" includes any attempt to build the child's oral skills -- speech or speechreading therapy, or auditory training. "Interpreting" refers to any attempt to circumvent the child's oral deficits. Various methods have been used: oral or manual interpretation, as well as notetaking services.

Löwe (1972a) distinguishes nine levels of integration which fall on a continuum ranging from full integration to complete segregation. Löwe's continuum actually combines several of the dimensions discussed above. The first level is "full integration." In Löwe's typology, full integration occurs when the child is integrated on an individual basis and when integration ranges from social to practical to academic. Any help which is provided by specialists in hearing impairment is episodic in nature, and is focused on helping the teacher plan for the child rather than on helping the child directly. However, the child will also have access to any general professionals that are provided by the school. Full integration can occur at both the elementary and secondary level.

Ideally, full integration occurs as the result of a decision by both parents and the school that the child is adequately prepared to cope with a regular setting, and that this constitutes the most advantageous placement. Another, though less common reason for an integrated placement is a decision of the child's parents to integrate, regardless of any professional advice to the contrary. Some parents, refusing to recognize the existence of a handicap or its potential educational consequences, insist on integration without a real evaluation of its feasibility.

A third reason for full integration is the failure of anyone to consider alternatives. Some children have not been selected for integration by either their parents or the schools, but have been "integrated" as the natural course of events. Not "deaf" enough for the special schools, these children were placed in regular classes and remained there because other special resources were not available or because the child was not recognized as having a loss. One can only speculate on the proportion of fully integrated children falling into each of these categories.

According to Bitter, Johnston and Sorenson (1973), most hearing impaired children who are integrated in the United States can be described as fully integrated. Seventy-nine per cent (79%) of the regular teachers of integrated children received only a brief orientation when the child first entered the class and from then on had no contact with a specialist. Follow-up of integrated children occurred in only a minority of the cases.

Type 2, as described by Löwe, is called "supplemented integration." In this type of programme, a child is usually integrated individually with a specially trained teacher of the hearing impaired available on a periodic basis. The special teacher advises both the teacher and the child, and may provide remedial services to the child. It is important to recognize that, in terms of degree, Type 2 represents full integration, and includes the entire range -- social, practical and academic. Type 2 can occur at both the elementary and secondary level. According to Fisher (1971), all children in the United Kingdom who have losses between 35 db and 60 db are provided with special teachers who visit them in their class on a periodic basis.

A Type 3 programme, as described by Löwe, is full integration with the child given several hours of remedial instruction daily by a specialist in hearing impairment. This may occur inside or outside of the regular class, but in either case the child's primary group identification remains his or her hearing peers.

Elizabeth Bowman (1973) describes such a programme in Suffolk County, New York. In this programme, there is a resource room attached to the regular school in which a specially trained teacher of the deaf is continually available. This special teacher provides tutoring and language training and advises teachers and their hearing impaired students.

Due to the intensive nature of the specialized help that is provided, Type 3 programmes usually require the integration of a group of hearing impaired children into a regular school. However, this is not always the case.

Dale (1972b) describes an itinerant programme in the United Kingdom in which, in addition to the itinerant teacher, there is a teaching assistant continually present with the child. The teaching assistant can tutor the child or provide additional explanation to make up for what has not been heard or understood. In this model, children are again integrated on an individual basis.

The programme described by Dale is unusual for Type 3 since the special resource person is continually available to the child. It is also unusual in that the service of "explanation" might be characterized as interpreting. It differs from interpreting in the full sense of the term in that explanation usually occurs after the teacher has stopped lecturing or giving instructions, and will occur on a selective basis when the assistant feels the child has not understood.

In interpretation proper, a continuous translation of teacher or student talk is presented. Jim Titus, at the University of Pittsburgh, is currently engaged in research on oral interpretation. In oral interpretation a person who is easily lipread repeats everything that is said in class without vocalizing. The student watches the interpreter instead of whoever in class is speaking directly. In some programmes interpretation is provided manually. There is such a programme at the secondary level in Massachusetts, and at the post-secondary level at George Brown College in Toronto. However, in both of these programmes, integration is again on a group basis, as is more usual for Type 3.[1]

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1 The George Brown programme is described by Mr. Ron Cope, coordinator of that programme. The remainder of the programmes involving interpretation were discussed at the VIIth World Congress of the World Federation of the Deaf, Commission on Pedagogy, Tuesday, August 5, 1975, Washington, D.C., and in conversations with Dr. Ross Stuckless at the same conference.

In integration Types 4 and 5, there is a special class attached to a regular school, and integration is again on a group basis. In Type 4, the hearing impaired students are integrated academically to the extent that they are able. This is partial integration, and the hearing impaired child maintains some identity with a special group. The resource person in this type of integration is a specialist in hearing impairment, and he or she can provide special help to students and to teachers on a continuing basis. The help provided to students would usually involve advising, tutoring and language training. However, in a special unit for deaf children in Anchorage, Alaska, manual interpretation is also provided. Whenever a deaf child from this unit goes into a regular classroom, he or she is accompanied by an assistant skilled in total communication (see footnote 1).

In Type 5, the integration of students from a special class occurs only in social or practical areas. All of the academic work occurs apart from hearing peers. This is a type of partial segregation, in which the child's main identity is with a special group, and integration occurs only on a group basis. Like Type 4, the resource person is a specialist who is continually available to consult with teachers and to provide remedial help to the child.

The remaining types are more often concerned with deaf as opposed to hard of hearing children. Lowe's Type 6 is a special day school in which there is no contact with hearing peers, except insofar as the child has such contacts at home and in the neighbourhood. Type 7 is a residential school where the hearing impaired child has contact with normal children only on the weekends or during holidays. Type 8 is a residential facility for multiple handicapped hearing impaired children, and Type 9 is a similar facility for hearing impaired children who are also mentally handicapped. Most of the children in Type 9 facilities will need protective care throughout their lives.

Returning to levels at which some integration occurs within the school, Types 4 and 5 can be seen as examples of unit organization. In each case there is a special class housed within

a regular school, staffed by trained teachers of the deaf, from which children are integrated to the extent that they are able.

However, units can be composed of more than one such class. This is the case with the Clairlea School in Scarborough, which has attached to it several classes of deaf children who are integrated into the regular school to the extent that they are able. Sudbury also has a unit for hard of hearing and deaf children in which a wide range of integration occurs. Most children in both the elementary and secondary unit are partially integrated, taking whatever subjects with regular students that they can handle.

The term "unit" is also used for entire special schools which are located adjacent to a regular school for the express purpose of facilitating integration. An example of this type is the Metropolitan Toronto School for the Deaf, which is actually housed in the same building as a regular elementary school. The advantage of the unit, particularly the larger ones, is that it can provide a wide range of integrative experiences from Types 2 through 6.

Fisher (1972) describes such units in England. Auble (1972) describes both individual and group integration via the unit concept in Michigan. Périer (1972b) discusses The Integrated School in Brussels, Belgium. This school provides a comprehensive range of programmes of Types 2 to 6. Children in the school have losses that range from marginal to profound, and all but the severely and profoundly deaf are integrated to some extent. However, at the time of Périer's report, only 5 out of the 45 students in the school were integrated for all subjects.

The unit system appears to be a reasonable, flexible way to insure that hearing impaired children will be integrated to the maximal extent that they are able. However, in a survey of such units in England, Hemmings (1972) found a great deal of variation in both the quality and quantity of integration that occurred. In some units surveyed, the extent of integration was purely social and informal, the sharing of a common school ground or lunch room.

But there are other difficulties in the unit system. Fisher (1972) argues that children lose continuity between their in-school and out-of-school friendships because they must be transported out of the

neighbourhood to the unit. Another problem is that since most units are small in size, classes may be extremely heterogeneous both in terms of academic ability and the degree of impairment.

Fisher also says that teachers who are in small units often feel extremely isolated from other specialists. The result is a high turnover rate among even very capable staff, causing a lack of programme continuity for the student.

Research on Integration

There is not much research on how well hard of hearing or deaf children succeed in integrated settings. As far as full integration is concerned, research cited previously suggests that even children with mild losses who are integrated in this manner may be educationally retarded (Quigley, n.d., and Fisher, 1971).

Similar results were found by VandenBerg (1971), who conducted a study of all children in regular classes in a New Zealand county who were wearing hearing aids. Most of the children in her study would be classified as hard of hearing as opposed to deaf. VandenBerg found that most children in the group were academically retarded, and that one-quarter had some emotional difficulties. However, almost all were performing at a level that was acceptable for the class, albeit a bit low. Peckham, Sheridan and Butler (1972) in another study of hard of hearing children, found general academic retardation among a group who had been diagnosed as hard of hearing (losses between 35 and 54 db).

Peterson (1971) found that hard of hearing students with losses ranging between 16 db and 66 db averaged three-quarters to one and one-half years academic retardation. Even the best achievers were functioning slightly below grade level, this in spite of speech therapy several times a week, and some itinerant help (Type 2).

We found no emperical data on the success of Type 3, 4 or 5 programmes, or on the success of the unit approach.

The studies reviewed above on full and supported integration suggest that hearing impaired children in regular classes do not perform at the level of their hearing peers. However, it is possible

that they might have been doing even worse in a segregated setting without the stimulation of a normal class.

In one of the few studies relevant to this question, van den Horst (1971) compared groups of hard of hearing children who were fully integrated in normal schools with similar children in special schools. The groups were matched for I.Q., age, sex, degree and nature of loss, and hearing aid use. The results indicate that the integrated group performed better on a verbal achievement test; however, more children in the special schools were judged to be well adjusted -- 86% vs. 54%.

Dale (1972a) found that close friendships rarely developed between integrated hard of hearing and normal children. Shears and Jensema (1969) found that deaf children tended to be somewhat rejected, even more so than children with other handicaps. Peterson (1971) found that integrated hard of hearing students felt frustrated and resentful of their status in the class, while segregated students evidenced good social adjustment and peer relations. However, Kennedy and Bruininks (1974) found that hard of hearing and deaf children actually had higher social status within the group than normally hearing children. This is an unusual result, even more so because it is usually found that all handicapped children tend to be somewhat socially isolated (Shears & Jensema, 1969; Lapp, 1957; Blatt, 1958; Johnston, 1962).

Along with concerns about social adjustment is the issue of self esteem. It has been argued that integrated children will have lower self esteem because they are comparing themselves to normal children rather than to other hearing impaired children. Craig (1965) actually found that institutionalized deaf children had higher self esteem than a group who were not institutionalized.

A recent study by Rister (1975) raises the notion of criteria, and the issue of what type of children can succeed in an integrated setting and what type of resources they might need. In her study, Rister found that 50% of a group of severely and profoundly deaf students were performing at grade level in a regular class. Forty per cent (40%) of the group had regular speech therapy, but there was

little other specialized help available. What characterized this group was that all of the children had received intensive oral training at a preschool level. Furthermore, their degree of success in school was related to the length of time they had been in the preschool programme.

A number of people have informally identified criteria that they believe to be required for successful integration. On the basis of their experience, Löwe (1972b) and Périer (1972b) argue that the following are necessary: average intelligence, supportive parents, good residual hearing, speech reading skills, motivation to succeed, good psychological adjustment, and proper preparation of the hearing impaired child, as well as the normally hearing children in the class. Périer emphasizes the importance of having a willing teacher, and correct seating of the child within the class. Löwe feels that the teacher needs assistance on a regular basis, and that the child and the teacher should be fitted with a wireless microphone FM receiver and transmitter.

A few empirical studies have addressed themselves to the question of criteria. Rister, for example, found no relationship between the age at which children had received their aids, and their later success in school. However, all of the children in that study had received an aid fairly early in life. Rister did find that success was related to the level of parental involvement with the child's schooling. However, intelligence did not differentiate successful from unsuccessful children, although all children in that study fell within the normal I.Q. range.

Vandenberg (1971) found that hard of hearing children who had attained high levels of performance in reading had above average levels of intelligence, came from English-speaking homes and had fathers whose occupation was at the skilled level or above. Good readers also all had losses of less than 50 db.

Peterson's (1971) study, however, questions the importance of residual hearing. Both high and low performing hard of hearing children in her study had a similar degree of impairment, averaging about 50 db. However, no one in the study had a loss exceeding 66 db, and thus all children had considerable residual hearing. But within this group, there was little or no relationship between the degree of

loss and level of achievement. Achievers and non-achievers also did not differ on hearing aid use, contact with other school professionals, nor on listening, lipreading, auditory or visual discrimination skills. However, all of the children in Peterson's group were academically retarded, and none could be labelled really successful.

The Present Study

Within Ontario, we identified and conducted an investigation of programmes of Types 1, 2, 4 and 5 -- full integration, supplemented integration, partial integration and partial segregation. The purpose of the present study was twofold. The first goal was to compare the relative success of the various types of programmes, in order to determine the value of integration. The second purpose was to collect empirical evidence as to the criteria required in order for a child to succeed in the various programmes.

In our investigation of integration, the primary focus was on hard of hearing as opposed to deaf children, although a few children with severe and profound losses were included. In evaluating the various programmes, we considered it crucial to consider both academic success and social adjustment.

Summary

The present study is primarily concerned with hard of hearing children and their academic and social success in integrated programmes.

Previous research suggests that even children with mild degrees of impairments are behind in school relative to their hearing peers. However, research also suggests that some types of children can succeed, and that integration may be preferable to segregation in special classes.

A variety of integration programmes are available at the present time. They differ not only in the degree to which the hearing impaired child is integrated with normally hearing peers, but in whether

the integration is merely social or extends into academic areas, whether the child is integrated individually or as part of a group of other hearing impaired children, and in the type and deployment of special resource personnel.

II -- THE PRESENT STUDY - SAMPLE

Criteria for Subject Selection

The terms of reference for the present study was the hard of hearing child. We originally defined "hard of hearing" as a loss falling between 25 and 75 db (ISO).* However, it was known that some children with greater losses had been integrated, and there was considerable interest from various quarters in including them in the study. As a result, we set 25 db as a floor for inclusion, and eliminated any upper limit.

The usual method of describing a loss is the pure tone average (PTA), which is the average threshold in decibels (db) at 500, 1000, and 2000 Hz. However, thresholds are usually also assessed at 4000 and 8000 Hz, and many important speech sounds occur at these frequencies. Thus, we adopted as the criterion for inclusion in the study a loss in the better ear of 25 db or more at two or more of the following frequencies: 500, 1000, 2000, 4000, and 8000 Hz.

Our initial terms of reference was the child with a sensory neural loss. However, during the course of the study we encountered many children who had conductive losses of a long duration. We decided to include children who had had a conductive loss for three years or more, since we felt that a loss of this duration would likely have affected their academic development.

To be included in the study, hard of hearing children, so defined, had to be at least seven years old, to have no other handicaps such as mental retardation or emotional disorders that would compound the effects of the hearing loss, and to have been in their present placement for at least six months. Parental consent was also required (see Appendix A).

Description of Programmes

Within Ontario, four different kinds of programmes were selected for examination:

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* All decibel designations refer to the ISO scale.

(1) full integration
(2) integration with itinerant help;
(3) partial integration;
(4) partial segregation.

(1) "Full Integration" describes the situation where a child is individually integrated into a regular class without the support of a specially trained teacher of the hearing impaired. Other school professionals may or not be in contact with the child. Seventy-seven (77) fully integrated students were included from the elementary and 12 from the secondary level. These students had been integrated under three different conditions -- deliberate placement on the agreement of both parents and the school, unilateral decision of the parents, and lack of alternative placements or failure to identify the loss. This condition corresponds to Löwe's Type 1.

(2) "Itinerant Help" is available in some locations in Ontario at both the elementary and secondary level. Students integrated in this manner are fully integrated into a regular class with the help of a trained teacher of the hearing impaired who visits them periodically in their own school. The services provided by the itinerant teacher include consultation with teachers and students, tutoring of students, language training and follow-up. Forty-two (42) such students were found at the elementary level and 17 at the secondary level. This is a type of supported integration as described by Löwe (Type 2).

In Fact, 11 of the children from the elementary level who were included in this group had a specially trained teacher of the hearing impaired continually available within the regular school. These children had been in a school for the deaf for most of their school career, and had only recently been integrated. Their support teacher was not an itinerant in the usual sense of the word, since she did not travel from school to school. However, the children in this group were always with a regular class, and the teacher was an itinerant in the sense that she followed the children into whatever classes they entered. In fact, these teachers were available to give special help to normally hearing children as well as those who were hearing impaired.

This is a type of supported integration, and these children were categorized with those receiving itinerant support. As a shortcut, the group as a whole will usually be referred to as the itinerant group.

(3) "Partially Integrated" students were found only at the secondary level. Their programme involved an initial segregation into a department for hearing impaired students, followed by partial integration into those subject areas in which they had demonstrated competence. Of the 11 students in this group, some were taking courses which are usually considered to highly "verbal" - i.e. English and other language related subjects (5 students), and courses in the social sciences (3 students). Seven (7) students were taking courses in science or math, areas which, although they are less verbal, have a high academic content. Four (4) students were taking courses in business theory, an area which is also largely academic in nature. The remaining courses were more practical - 3 students were taking business practice, e.g., typing, office machines, etc.; 4 were enrolled in shop course; and 3 were taking art or music. Ten (10) of the 11 students were taking physical education courses with regular students. This corresponds to Lowe's Type 4.

(4) By "partial segregation" we refer to children attending special classes for the hard of hearing which are located in regular schools. These children were, in fact, not completely segregated since they may have had informal contact with normally hearing children at recess and during lunch, or more formal contact during physical education and practical classes like home economics or shop. However, all of their academic work occurred apart from their hearing peers. All of the children in hard of hearing classes were at the elementary level. A random sample of 36 was included in the study. This corresponds to Lowe's Type 5. As a shortcut, this will be referred to as the segregated group, since it is the most segregated of all the four groups that were included in the study, and segregation was complete with reference to academic subjects.

Location and Identification of Subjects

Subjects for the study were located in four different areas of Ontario: Metropolitan Toronto, London, Halton County, and Kingston-Frontenac County.

(1) Metropolitan Toronto. Within Metropolitan Toronto, students were included from all six boroughs and their respective boards: Toronto, York, North York, East York, Scarborough and Etobicoke.

Metropolitan Toronto contributed students from all four types of programmes. Students in the "partially segregated" programme came from the six hard of hearing classes scattered across Metro. Partially integrated students at the secondary level were all located at a facility of the Toronto Board of Education.

There are four itinerant teachers within Metropolitan Toronto who provide service to elementary students in all six boroughs. North York has an additional itinerant teacher who supervises the integration of secondary students within that borough. Hard of hearing children who were integrated with itinerant support were identified from their files.

Hard of hearing students from Metro who were fully integrated were identified from school files and from the records of a parents' group. There were children in this category at both the elementary and secondary level. A few attended private school.

The Metropolitan Separate School Board also provided subjects for the study. Although the Separate Board had recently initiated a programme of itinerant assistance, most of the hard of hearing children in that board had been fully integrated without special help for most of their academic lives. These students were identified by the Speech and Hearing Department of that board, which had recently made a major effort to locate all hard of hearing children who had not previously been identified.

(2) London. The London Board of Education provides special classes for hearing impaired children up through Grade 6. Children received into these classes are given special help and integrated into the mainstream as soon as they are able, generally by Grade 3. However,

after Grade 6, all hearing impaired students in London are integrated into regular classes, unless they have been placed in one of the regional facilities for the hearing impaired.

London was initially included in the study to investigate this model of integration; however, too few students had progressed through the programme to make a separate study feasible. Therefore, London students were classified as fully integrated. No children who were currently in the hard of hearing classes in London were included.

London subjects were identified from a computer print-out of all hearing impaired children in the county which was provided by the Middlesex-London District Health Unit. London students were at both the elementary and secondary level.

(3) Kingston-Frontenac County. Data were collected from Kingston-Frontenac County because it was originally thought that a large number of unserviced but fully integrated students would be found there. Although an exhaustive search was made of the files of the Kingston, Frontenac and Lennox and Addington Health Unit, only a very small number of such subjects were identified. The majority of subjects that were finally included in the sample from this area were served by an itinerant teacher employed by the Kingston-Frontenac County Board of Education. These students were at both the elementary and secondary level.

(4) Halton County. Audiological screening test results were made available from the Halton County Public Health Department. The Ernest C. Drury School, which performs many of the complete audiological assessments of students throughout Halton County, also made their files available. We had expected that these files would also identify many students who were integrated without special support services. However, very few were found. The few who we did uncover were included in the study.

The Ernest C. Drury School has a programme in which several students who were originally residents at the school have been integrated into regular schools in Milton. These students were aided by two special teachers from the Ernest C. Drury School who were continually available should they or their teachers need special help.

Some of these students were provided with a radio-frequency individual hearing aid system. Several additional children who were fully integrated into Halton County schools also had this system. We had originally intended to make a separate study of its value, but too few subjects were found to make this feasible. The students from the Ernest C. Drury School who had this type of aid were simply included in the Milton group. The Milton group as a whole was considered to constitute a variant of itinerant support. The remaining students in Halton County with a radio-frequency individual hearing aid were classified as "fully integrated."

Sample Attrition

Many students identified from school or Public Health records could not be included in the study. Following is a list of the reasons which made inclusion impossible, and the number of students falling into that category:

(1) Hearing Loss: Although originally thought to satisfy the criteria for inclusion, closer examination of the audiogram revealed that the student did not qualify because the loss was not sufficiently severe, was a conductive rather than a sensori-neural loss, was a "rock-and-roll" loss, or had been corrected (665 students).

(2) No audiological diagnosis available (80 students).

(3) One-eared loss: Student satisfied criteria in one ear only (18 students).

(4) Loss corrected and hearing normal at the time of the study (31 students).

(5) Presence of additional handicaps that would confound the consequences of the hearing loss (24 students).

(6) Too old or too young (17 students).

(7) In current programme for less than six months (51 students).

(8) Parental permission denied (97 students).

(9) Opinion of the school that inclusion in the study would disrupt relationship with the parents (11 students).

(10) Removal from school district, including transfers to another board, moving to another province or another country, or involvement in a home study programme (89 students).

Some of these categories are significant and indicate areas worthy of further inquiry. The "one-eared" child does not satisfy the usual requirements for defining a hearing loss, including our own; however, this type of child may have difficulty hearing in a classroom or a group. Likewise multiply handicapped children and their problems should not be ignored.

The failure to obtain parental permission in 97 cases is also significant. The involvement required of students for the study was quite extensive. In most cases, parental refusal occurred when the child was not involved in any special programme. Some parents were quite irrate that the educational system would request the help of their child in a research study when it had not provided any special resources for them. The large body of parental refusals, therefore, represents children who are fully integrated because of lack of alternative placements. Some refusals occurred because the parents did not want it widely known within the school that the child was hard of hearing.

Summary

Four programmes from Ontario were chosen for study. The first can be described as full integration in which hard of hearing children are placed in regular classes without any specialized help. The second is integration with itinerant help in which the integrated student receives the services of a specially trained teacher of the hearing impaired. Both elementary and secondary students are involved in these two programmes.

The third was investigated only at the secondary level. It is partial integration in which students are placed in a special unit

in a school and are integrated for individual subjects to the extent that they are able.

Finally there is segregation into hard of hearing classes. In this case all of a child's academic work takes place in the special class. For hard of hearing children, this occurs only at the elementary level.

Subjects for the study were drawn from the six Boroughs of Metropolitan Toronto (both the Public and Separate school systems), London, Kingston-Frontenac and Halton Counties.

III -- THE PRESENT STUDY - SOURCES OF DATA

Data Collected From Students

1. Audiograms

Hearing thresholds were obtained for the better ear at 500, 1000, 2000, 4000, and 8000 Hz, and a diagnosis of whether the loss was sensori-neural or conductive.

Audiograms were obtained from hospitals, public health clinics, school records, and various private doctors and audiologists by parental request. They thus represent the results of professional and complete assessments. Audiogram dates ranged from 1967 to 1975. Seventy-one per cent (71%) of the audiograms had been taken since 1973, i.e. they were no more than two and one-half years old. An additional 14% were up to three and one-half years old, and the remaining 15% ranged up to eight and one-half years. Thus the vast majority were fairly recent.

2. Aural and Oral Functioning

It is well known that a child's ability to function in an oral world cannot be predicted from a knowledge of the audiogram alone. For this reason, speech audiometry is often used to complement the information from responses to pure tones. In speech audiometry, the average threshold of response is determined for a standard list of words (spondee words).

However, speech audiometry is not routine, and we did not feel that it was practical to test all children who had not previously been tested with this measure. In addition, we felt that it was necessary to have some measure of how well the child could function in a natural environment.

A search through the literature failed to uncover any test which met our requirements. Accordingly, a new test was constructed with an attempt to satisfy the following criteria:

(1) Items were comprised of natural language which varied in phonetic, syntactic, and semantic type and complexity. This feature provided a broad sampling of language behaviour as well as varying item difficulty.

(2) Items contained redundancies of the type associated with natural language. Thus, subjects had the opportunity to use context as an aid to comprehension.

(3) Items sampled a variety of tasks. Thus, a subject could not get a high score through proficiency in only one type of item. Item variety also added interest to the test, and increased subjects' motivation.

(4) Items were appropriate for a wide age range. In fact, some of the simpler items were a bit too juvenile for the older students, but they generally accepted them with good grace when the purpose of study was explained. The more difficult items were appropriate for all ages.

(5) Items varied in difficulty. This was achieved by varying phonetic, syntactic and semantic complexity, by varying type of task, as well as by withdrawing or adding context. Very simple items were placed at the beginning of the test so that subjects with no aural skills could be easily recognized and the test quickly terminated.

(6) Items did not require reading or writing skills either to comprehend or to respond. Items were orally administered on a one-to-one basis. A few items required a limited spoken response, but most were of a performance nature.

(7) Any normally hearing child of school age, with normal intelligence, should be able to respond correctly to all items. This criterion was included to make the test culture free. Poor performance was to result solely from a lack of aural or oral facility, and not from lack of knowledge or particular academic or cultural experiences.

This is an eclectic test in which items were selected from a variety of sources: Butt's Children's Speechreading Test, The Craig Lipreading Inventory,[2] and Bereiter's "Catching On" Workbook

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2 The Butt and Craig tests, as well as other instruments designed to assess lipreading ability, are described in Jeffers and Barley (1971).

Series (Bereiter, 1974). Illustrations for the items were found in the Illinois Test of Psycholinguistic Abilities (Kirk et al, 1968), the Peabody Picture Vocabulary Test (Dunn, 1965), or drawn freehand. In any case in which items or illustrations were selected from published materials, the materials themselves were purchased and used "as is" in the test. Only four copies of the test were produced.

The result of this testing strategy was a test which is not at all diagnostic. On the basis of a student's performance, it is not possible to describe his or her areas of strength and weakness, or to develop a programme of remediation. Rather, a person's score is a general description of how well he or she is likely to function in the classroom in comprehending the speech of a teacher of classmate.

Two equivalent forms of the test (A and B) were constructed, each with 22 items (see Appendix B). One form was administered with the subject not permitted to see the tester's face. This score provided a measure of aural (i.e. hearing only) ability. Another form was administered with the subject able to see the tester's face. This score provided a measure of oral (i.e. hearing plus lipreading) ability. The discrepancy between the two scores yields a measure of the extent to which the subject relies on visual cues (i.e. lipreading).

In all cases the oral test was administered first. Half of the subjects received Form A for the oral and Form B for the aural test. For the remaining subjects, the procedure was reversed.

Some difficulties were uncovered in making the aural and oral presentations equivalent except for the presence or absence of lipreading cues. If the testers covered their mouths during the aural presentation, the sound would be muffled. The solution was to cover the subjects' eyes with masks.

However, this prevented their attending to the response alternatives which, in many cases, was a set of pictures from among which the correct response was to be chosen. During the oral test, they could attend to these if they so desired. Subjects might differ in the amount of time they looked at the response alternatives and the amount they attended to the speaker's face. On the other hand, if subjects were not allowed to view the response alternatives during the presentation of the item, there might be a memory problem, and

subjects might have difficulty remembering what the item was by the time they were allowed to view the response alternatives. These problems were solved by using the following procedure for items where the response alternatives were presented visually:

(1) response alternatives were briefly exposed so that the subject could become familiar with them;

(2) the response alternatives were screened from the subject's view;

(3) the item was presented;

(4) the response alternatives were again presented for the subject to view and make a choice.

This solution is not perfect because it does not completely preclude the possibility of a memory overload. But because there was an attempt to limit the degree of memory required by the items themselves, this should not present too great a problem.

Another problem concerns the use of a hearing aid during the test. Since not all subjects had aids, one possibility would have been to forbid all subjects to use their aids. However, this would underestimate the functioning ability of those who did have aids and used them effectively.

The solution was to test each child as he or she came on the day of the test -- either with or without an aid. We felt that any instruction to the teacher or parent would be likely to distort the child's usual pattern of hearing aid use. For the same reason, we did not attempt to adjust the aid in any manner.

A final problem was the testing conditions themselves. An argument could be made that testing should have been carried out in the child's own classroom. That would have been most natural; however, it would also have caused extreme variation in noise level from class to class and from day to day. It would also have been disruptive to the normal class routine.

It was, therefore, decided to administer the test in a quiet room. As a result of this decision, the performance of subjects is surely an overestimate of their abilities; however, it is likely an overestimate of all subjects' abilities to a similar extent.

In administering the test, the tester sat opposite the subject at a distance of about one and one-half feet. The oral test was administered first followed by the aural test. During the aural test, the subject was provided with a mask which blocked direct as well as peripheral vision. When the time came to respond, subjects were tapped on the shoulder as a signal to remove their masks.

Due to the heterogeneous nature of the sample, it was expected that not all subjects would be able to respond to an aural-only presentation. In order to avoid creating a stressful experience, it was decided that if any subject answered the first four items of the aural test incorrectly, testing would be terminated. However, it was only necessary to terminate the test for one subject.

In general, it took 1/2 hour to administer both tests. Even so, however, younger children were usually administered a different instrument between the oral and aural presentations in order to minimize boredom.

Due to time constraints of the study, we were unable to properly pilot test the instrument. All that could be done was to try it out on an informal basis with a few hard of hearing and normally hearing children. However, the tests functioned well as tests. An item analysis performed subsequent to the data collection revealed that, for the aural administration all of the items had a correlation with the total score that was significant at or beyond the .001 level. The average correlation over all items was .60 for Form A (n = 92) administered aurally and .54 for Form B (n = 101). For the oral administration of Form A, 17 of the 22 items had a correlation with the total score that was significant at or beyond the .05 level and two more items were significantly related to the total score at or beyond the .20 level. Thus, only three items did not function well. The average correlation over all items was .36 (n = 102). For the oral administration of Form B, 19 of the items were significantly related to the total score at or beyond the .05 level. The average correlation over all items was .43 (n = 93). Thus, the tests were reliable.

There is also evidence of the tests' validity. Subjects' pure tone average correlated significantly with both aural ($r = -.58$, $p \leq .001$) and oral ($r = -.40$, $p \leq .001$) functioning scores. The two tests correlated significantly with one another ($r = .76$, $p \leq .001$). However, scores were independent of IQ. Thus, they do measure variation in comprehension which is due to listening and lipreading skill, rather than to general intelligence.

3. Hiskey-Nebraska

The Hiskey-Nebraska Test of Learing Aptitude (1966 revision) was chosen to measure intelligence. This test was chosen because it is a performance rather than a verbal or a combination verbal-performance IQ test, and because it was specifically designed and has norms for hearing impaired children. On a sample of hearing children, Hiskey-Nebraska scores had a correlation of .83 with scores on the Stanford-Binet. Thus, the Hiskey-Nebraska measures the same type of intellectual functioning as do more traditional tests, without their verbal bias. Furthermore, Giangreco (1966) found that the Hiskey-Nebraska predicted the academic performance of deaf students in a variety of areas.

The test is provided with both verbal and pantomimed instructions. Dr. Hiskey (p.21) states that the pantomimed instructions are more appropriate for deaf and hard of hearing subjects. Therefore, although the sample included students with a wide range of hearing loss and communication skills, the pantomimed instructions were used throughout. This procedure was chosen to insure that all subjects would have an equal chance of understanding the tasks.

The test was administered by four experienced psychometrists who had been given specific training in the administration of the Hiskey to hearing impaired children. Administration of the test took about 45 minutes.

4. Achievement Tests: CAT

Two tests -- Language Usage & Structure and Reading Comprehension -- were chosen from the battery of the California Achievement Tests to assess subjects' success in school. Each of these tests has 5 levels, covering all of the elementary and secondary grades. The two tests chosen seemed to be most appropriate to the particular difficulties

of hearing impaired children. The language test emphasized usage and structure, not mechanics such as capitalization and punctuation. The reading test emphasized comprehension rather than mere word recognition. The possibility of administering a math test was considered and then discarded because of the time involved. The California tests were chosen because of their use in the past with hearing impaired students.

Unfortunately, the California tests had been recently revised. Once the test order had been filled by the distributors and testing began, it was noted that levels 3, 4 and 5 of the Language Test did not seem appropriate to the Ontario curriculum. For example, some questions required a prior introduction to the principles of transformational grammar and formal logic. However, subsequent item analysis revealed that the Language Test had performed in an acceptable manner, although not at the level one would hope.[3] Results of this test, therefore, should be interpreted with caution. No such problems were encountered with the reading test.[4]

5. Self Concept

The North York Self Concept battery (Crawford, 1972) was chosen to provide a general measure of student's self esteem. Items in that test covered both academic and social areas, and the test, therefore, encompasses students' overall feelings about school and their position in the class.

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3 Language Usage Test. For each of the five levels of the test, the following information is given: the number of subjects given that level, the proportion of items having a correlation with total score that was significant at or beyond the .05 level, the number of items with correlations significant at or beyond the .20 level, and the average correlation over all items.

level 1 ($n = 44$) - 13/20 at $p \leq .05$; 2/20 at $p \leq .20$; $\bar{r} = .30$.
level 2 ($n = 49$) - 18/24 at $p \leq .05$; 5/24 at $p \leq .20$; $\bar{r} = .38$.
level 3 ($n = 48$) - 9/24 at $p \leq .05$; 6/24 at $p \leq .20$; $\bar{r} = .21$.
level 4 ($n = 32$) - 11/24 at $p \leq .05$; 5/24 at $p \leq .20$; $\bar{r} = .24$.
level 5 ($n = 20$) - 4/24 at $p \leq .05$; 6/24 at $p \leq .20$; $\bar{r} = .13$.

4 Reading Test (see explanation for footnote 3).

level 1 ($n = 38$) - 22/24 at $p \leq .05$; 1/24 at $p \leq .20$; $\bar{r} = .51$.
level 2 ($n = 48$) - 37/45 at $p \leq .05$; 5/45 at $p \leq .20$; $\bar{r} = .38$.
level 3 ($n = 48$) - 33/42 at $p \leq .05$; 4/42 at $p \leq .20$; $\bar{r} = .30$.
level 4 ($n = 32$) - 31/45 at $p \leq .05$; 8/45 at $p \leq .20$; $\bar{r} = .34$.
level 5 ($n = 20$) - 19/45 at $p \leq .05$; 15/45 at $p \leq .20$; $\bar{r} = .34$.

The North York battery includes a primary version which is usually used with kindergarten and grade 1 children, an intermediate version intended for grades 2 through 6, and a junior high version for grades 7 through 9. However, because of the reading difficulties of hearing impaired students, it was decided to use the primary version with all elementary pupils and the junior high version with all secondary pupils. Some minor changes were made in the wording of the secondary form to make the items easier to understand, and two more questions which relate to academic areas were added. (see Appendix C)

Subsequent item analysis of the elementary form showed that 24 out of 27 items had correlations with the total score that were significant at or beyond the .01 level, with an average item correlation of .39 (n = 153). For the secondary form, 26 out of 33 items had correlations that were significant at or beyond the .05 level, and 5 more at or beyond the .20 level. The average correlation over all items was .35 (n = 40).

6. Speech Intelligibility

Most approaches to measuring intelligibility are analytic in nature, and are based on articulation errors or an analysis of other qualities of the speech signal. The purpose of many of these studies has been to determine what, in general, differentiates intelligible from unintelligible speech, rather than to measure individual differences in the speech of individuals (e.g., Speaks, 1969; Nakatani & Dukes, 1973; Speaks et al, 1972).

Larr and Stockwell (1959) report on the development of a test to measure the relative intelligibility of the speech of deaf children. However, their test is also analytic in nature, based on the linguistic notion of minimal phonetic pairs. In Markides' (1968-70) study of the speech intelligibility of partially hearing children, the purpose was also largely analytic and diagnostic in that Markides hoped to determine what type of articulation errors most characterized his sample.

Markides did, however, include ratings of speech intelligibility in which teachers of the deaf and lay people rated the overall quality of the child's speech on a 6 point scale. He found that there was a high level of agreement both within and between judge groups, and that

these subjective ratings agreed with more analytic measures of intelligibility. Speaks et al. (1972) also found that subjective ratings related well to more objective measures. Smith (1972) has also used global judgements of speech intelligibility in research with hearing impaired children.

For practical and logical reasons, we decided to adopt this subjective approach. The practical reason is that subjective judgements of overall quality can be made very quickly. The logical reason is that we were interested in how intelligible the child was likely to appear to the regular classroom teacher. Our purpose was evaluative and descriptive, rather than diagnostic. Although analytic and subjective measures have been shown to relate to one another, there is not a one-to-one correspondence. No one can give an exact description of how various phonetic and syntactic errors affect overall intelligibility. Doubtless some types of errors are more critical than others. We, therefore, felt it was more appropriate to measure intelligibility directly.

There are various ways this can be done. One approach would be to ask each subject to repeat a passage, and then test how well the message was understood. But this requires that separate messages of equal difficulty be constructed for each subject, and that subjects then either read or memorize them. The only feasible way to do this would be to select two large groups of words, and have the message for each subject be a subset chosen from this larger group. However, we felt that the intelligibility of connected discourse might be different from the intelligibility of words in isolation. There is also the possibility that reading problems would compound intelligibility difficulties.

Our approach, therefore, was as follows, and was designed to obtain a fairly lengthy sample of natural, spontaneous speech. A set of stimulus cards was shown to each subject.[5] The cards were arranged into meaningful sequences, and the student was encouraged to "tell a story." Students were first presented with a sample set which was used to illustrate the task. In this pre-test, the tester encouraged subjects to produce an elaborated story rather than a simple, unconnected sequence of descriptions.

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5 Multi-Sensory Sequence Cards (MUST): Unit 1 -- Around the House, Educational Design Associates: East Lansing, Michigan, 1972.

After the pre-test, students were shown the initial card of the remaining 5 sequences, and the tester gave a brief description of each. On the basis of this preview, subjects were then asked to choose which set they would like to describe. Testers continued to provide picture sequences until approximately two minutes of taped speech had been obtained. Speech samples were recorded on a Sony cassette taperecorder, with built-in microphone (Model TC-110B). This equipment was judged to have good reproduction capability.

The speech samples were rated by three judges, all of whom were experienced teachers or counsellors of normally hearing children, but who had had no direct contact with the hearing impaired. Markides' (1968-70) research shows that, although trained and untrained judges agree on the relative intelligibility of the speech of hearing impaired children, judges who are experienced with the deaf have higher levels of comprehension than do judges without such experience. We were interested in how intelligible the children would appear to regular teachers, and so we chose untrained judges.

Speech was rated on a 7 point scale as follows:

0 - speech so full of grammatical and pronounciation errors as to be <u>virtually unintelligible</u> (0%)

1 - grammatical and pronounciation errors render speech <u>almost completely unintelligible</u>; only some isolated words or phrases are understood, and these with great difficulty (20%)

2 - grammatical and pronounciation errors render <u>most</u> of speech <u>unintelligible</u>; quite a few phrases are understood, but with great difficulty (40%)

3 - speech is about <u>equally divided</u> between intelligible and unintelligible phrases (50%)

4 - <u>most</u> of speech is <u>intelligible</u>; grammatical and pronounciation difficulties obscure the meaning of quite a few phrases OR although speech is generally intelligible, it is only apprehended with great difficulty (60%)

5 - <u>almost all</u> of speech is <u>intelligible</u>; grammatical and pronounciation difficulties obscure the meaning of only some phrases OR speech is generally intelligible but with some difficulty (80%)

6 - speech is <u>virtually completely intelligible</u>; speech reaches standards of normal speech with no difficulty in comprehension (100%).

Each person judged all of the speech samples, but in varying order to equalize the effects of experience with the task. Reliability of judgements was quickly and easily established. The average correlation among the ratings of the three judges was .86. A subject's score was the average of the three ratings.

Data Collected From Teachers

7. Social Adjustment

The Bristol Social Adjustment Guide was used as a measure of the social adjustment of the student in school. Various forms of this instrument are available, including forms appropriate to the school, the home, and the residential setting (Stott, 1971). The BSAG is a diagnostic tool which provides a behaviour profile of individual children. It has also been used for research purposes with deaf children.

It is important to note that this is a teacher report instrument. Although its reliability and validity have been established, it depends on the teacher's perception of the student, which is essentially subjective in nature.

8. Teacher Knowledge Questionnaire

This questionnaire was developed to provide a crude estimate of a teacher's knowledge of hearing impairment and the classroom management of the hearing impaired child. Thirty-two questions were derived from handbooks and materials developed to educate laypeople about hearing impairment. The most important source was an article by Gildston (1973).

The questions were in a true or false format, and each teacher's score was the number of items answered correctly. See Appendix D for a copy of this instrument.

This instrument was also mailed to a randomly selected sample of 303 teachers from Toronto and Kingston. The purpose of this substudy was to determine how much teachers who had not had hard of hearing children in their class would know about the problem of hearing impairment.

9. Attitudes Toward the Hearing Impaired

This questionnaire was used as a measure of the attitudes of regular teachers to the hearing impaired students in their class. The actual instrument is a modification of the short form of the "Attitudes Toward Disabled Persons" questionnaire by Yuker, Block and Young (1970). The modification consists of substituting the words "hearing impaired" for "handicapped," which is the modification recommended by the authors when the test is used to assess attitudes toward specific handicapped groups. Evidence of the reliability and validity of the scale is given in the article by the authors.

The scale is based on the assumption that negative attitudes toward handicapped people find expression in the feeling that such people are basically different from normal individuals in personal characteristics and in the way they should be treated. The scale consists of items describing a variety of such differences. Respondents are asked to indicate whether or not they agree with the description, using a scale running from +3 to -3. A copy of the questionnaire and the scoring procedure appears in Appendix E.

10. Classroom Information Questionnaires

A series of questionnaires was used to collect information on a variety of aspects of the student's educational environment. There was an elementary and two secondary forms to be filled out by the child's teachers. One set of questions solicited information on the child's language background and parental involvement. This information was not actually used in the analysis since it was almost always possible to obtain similar and more valid information of this sort from parents.

An important question on these forms was the extent to which the student used a hearing aid in school. Another important section dealt with modifications which the teacher had made in order to accommodate a handicapped child in a regular class, and questions on the extent to which the child received help from other school professionals. Also of great importance was teacher ratings of how well the child functioned in class overall, and how well he or she functioned in reading. On each of these questions the teacher rated each child as "well above the class average," "somewhat above the class average," "at about the class average," "somewhat below the class average," and

"well below the class average." Teachers were also asked to describe any difficulties they or the child had as a result of the handicap, but this data did not turn out to be very useful.

Two questionnaires were required at the secondary level because of the rotary nature of the programme. One of the student's subject teachers was selected to contribute information on his or her functioning in class. An attempt was made to select first a teacher in a language area, and if there was none, then a teacher of some other academic subject. Eighty-seven per cent (87%) of these, or 34, were teachers of English or other language arts courses. Five per cent (5%) or 2 teachers were from social studies, and 8% or 3 were from practical business courses.

A second "Summary Sheet" was filled out in consultation with whatever school staff were required in order to obtain the information. This sheet provided information on the student's overall school programme, including information on the type of school, the number of courses he or she was taking in various areas, and use of other school professionals. Number of credits and grade point average was also obtained. But since this information was unavailable for a great many students, it is not included in this report.[6]

Finally, there was an educational summary sheet which described, for each year that the child had been in school, the type of programme in which he or she had been enrolled and the number of programme changes, if any, that had occurred. See Appendix F for copies of these questions.

11. Itinerant Teacher Questionnaire

Itinerant teachers gave information on how long they had been following the child, the amount of time per week they spent with him/her, and the type of assistance they gave (see Appendix G).

Data Collected From Parents

12. Parent Interview

Parents were interviewed by telephone and queried about their language background, level of involvement with the school and

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6 There are several reasons for the unavailability of this information. Quite a few of the secondary students were in grade 9, and thus had not yet completed a full year. Some schools assign letter grades instead of numbers, or even pass/fail.

degree of help given the child, educational level, expectations for their child's education, hearing aid use at home, as well as speech intelligibility and out-of-school activities (see Appendix H).

Training and Testing Procedures

Five different testers were trained in administering all instruments except the intelligence test. Training for three of the testers occurred during a three-day workshop held in the Fall of 1974. The other two were trained individually at a later date. Training included practice sessions with hearing impaired individuals.

The four psychometrists who administered the Hiskey-Nebraska Test of Learning Aptitude, were given specialized training in the administration of this test to hearing impaired subjects.

Permission to conduct the study was obtained from all the relevant Boards of Education. Working through a liaison person in each Board, contact was established with principals, and through them with participating teachers and students. In all cases, parental permission was obtained. Altogether 195 subjects were tested.

On a tester's first approach to a school, the Teacher Information Questionnaire was usually given to the teacher. The remaining instruments were administered as they could be scheduled. Because of the heavy testing programme, children were usually seen on two or three different occasions.

Summary

The following information was collected as part of the present study:

A. Data Collected From Students --

1. Pure Tone Audiogram;
2. Aural and Oral Functioning Test;
3. Hiskey-Nebraska Test of Learning Aptitude;
4. Standardized tests of Reading and Language Achievement;
5. Self Concept;
6. Speech Intelligibility;

B. Data Collected From Teachers --

7. Bristol Social Adjustment Guides;
8. Teacher Knowledge Questionnaire;
9. Attitudes Toward the Hearing Impaired;
10. Classroom Information covering hearing aid use, classroom management techniques, child's functioning in class, educational history;
11. Itinerant Teacher Questionnaire covering type of assistance given;

C. Data Collected From Parents --

12. Parental Interview covering language background, educational support, hearing aid use at home.

IV -- WHO GETS INTO VARIOUS PROGRAMMES?

Sample Description

There were two reasons for carrying out the study in various locations throughout the Province. The most obvious and primary reason was to provide us with various models of integration. Metropolitan Toronto, London, Halton County, and Kingston all provide for their hearing impaired children in different ways. But using subjects from various centers also serves a second purpose, which is to help overcome a sampling problem.

Within each center there are a range of alternatives for placing the hard of hearing child. If these are arranged on a continuum ranging from complete segregation to full integration, it is likely that children with greater losses will have placements to the left of the continuum and those with milder losses will have been placed in programmes to the right. This makes it difficult to compare the relative effectiveness of different programmes since they are dealing with different types of children. However, since the range of services is somewhat different in the different centers, and since different criteria are likely used in placing children, the sampling problem is somewhat alleviated. A child who in Kingston would merit one type of placement might obtain a different placement in Toronto. Thus, we have increased the probability of finding similar children in different programmes, and thus being able to say something about the relative success of each approach.

From a research point of view, it would be desirable if the various programmes had similar populations of children. However, as will be seen, there are differences in the children which different programmes serve. But there is also a great deal of overlap, and it is this which will allow us to tease out the effectiveness of various programmes, as well as to discover what types of children best succeed in them.

Hearing Loss

When considering hearing impaired children, the first characteristic which comes to mind is their degree of hearing loss. Our criterion for inclusion in the sample was a loss of 25 db or more over two or more of the following frequencies in the speech range: 500, 1000, 2000, 4000, and 8000 Hz. A more usual measure of hearing loss is the pure tone average (PTA), which is the average threshold at 500, 1000, and 2000 Hz. It was thus possible for a child to qualify for the sample while having a PTA within the normal range. In terms of PTA, children in our sample actually ranged from a low of 12 db to a high of 110 db, with an average loss of 51 db. Thirteen per cent (13%) fell within the normal range of 0 - 25 db. Another 25% had what would be described as a mild loss (26 - 40 db); 21% a marginal loss (41 - 55 db); 21% a moderate loss (56 - 70db); 16% a severe loss (71 - 90 db); and 3% a profound loss (90 db or greater).

We also constructed a new measure which we call the High Frequency Average or HFA. It is calculated as the average loss at 4000 and 8000 Hz. HFA for our sample is somewhat higher than PTA, with a range of 0 db to 110 db, and an average of 64 db. This reflects the fact that 45% of the sample have what is described as a falling audiogram, which means that they have a greater loss at the higher frequencies. We defined "falling" in a rather crude way as the case in which HFA exceeded PTA by 15 or more db. The converse is also possible - a person may have a greater loss at the lower frequencies. We defined a rising audiogram as one in which PTA exceeded HFA by 15 or more points.[7] However, only 6% of the sample had audiograms which could be so described.

The shape of an audiogram is important because it relates to the usefulness of a hearing aid. Generally speaking, people with a flat loss, i.e. neither rising nor falling, have less difficulty accepting an aid. We also felt that HFA might be important because many of the speech sounds occur at the higher frequencies, particularly

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7 See Carhart (1945) for more complete and sophisticated, and also more complicated, procedure for classifying audiograms.

consonants. Two children with equal PTA's, but one of whom has a falling loss, might be in very different positions vis-a-vis integration. Not all children in the sample had or were currently using hearing aids (see p. 43).

Children in the various programmes differed in the extent of their loss. At the elementary level, fully integrated children had an average PTA of 42 db, which is just within the marginal range. Children receiving itinerant help had an average PTA of 54 db, which lies at the upper end of that range. Children in the hard of hearing classes averaged 63 db, which is within the moderate range (see Table 1).[8,9 & 10]

The same pattern occurred with HFA.[11 & 12] Fully integrated children averaged 52 db, within the marginal range; children receiving itinerant help fell at the upper edge of the moderate range with an average HFA of 69 db; and children within hard of hearing classes averaged 76 db, falling within the severe range. There was no difference among students in the various programmes in the shape of their loss.

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8 Throughout this report, the following method was used to assess the significance of the difference between groups. Using regression analysis, a test was first made of the difference between the least integrated group and the other two. At the elementary level this was the children in the hard of hearing classes, and at the secondary level, those in partially integrated programmes. Programme was entered as a dummy variable. Next, using the same procedure, a test was made of the difference between children who were fully integrated and those receiving itinerant support. Children in hard of hearing classes (elementary) and those who were partially integrated (secondary) were eliminated from this part of the analysis. We will report results giving F values, degrees of freedom (df), level of significance (p) and proportion of variance accounted for (r^2), always indicating the particular comparison made as either "Integrated vs. Segregated" or "Itinerant vs. Fully Integrated." A "p" value of .05 or less indicates that the difference between groups is statistically significant. Proportion of variance accounted for is an indication of the size of the difference. This value (r^2) can range from .00 to 1.00.

9 PTA (elementary) - Integrated vs. Segrated:
$F = 14.044$; $df = 1/135$; $p \leq .05$; $r^2 = .09$.

10 PTA (elementary) - Itinerant vs. Fully Integrated:
$F = 6.147$; $df = 1/100$; $p \leq .05$; $r^2 = .06$.

11 HFA (elementary) - Integrated vs. Segregated:
$F = 13.415$; $df = 1/133$; $p \leq .05$; $r^2 = .09$.

12 HFA (elementary) - Itinerant vs. Fully Integrated:
$F = 11.313$; $df = 1/99$; $p \leq .05$; $r^2 = .10$.

TABLE 1

HEARING LOSS FOR THE TOTAL GROUP AND BY PROGRAMME AND GRADE LEVEL

Group	Severity of Loss (%)						PTA[a]	HFA[b]	Percent with[c] Falling Loss
	Normal (0-25)	Mild (26-40)	Marginal (41-55)	Moderate (56-70)	Severe (71-90)	Profound (91+)			
Elementary									
Full integration (n=63)	27	25	24	13	10	2	42	52	40
Itinerant help (n=39)	8	33	15	21	13	10	54	69	42
Hard of hearing classes (n=35)	3	9	20	40	26	3	63	76	44
OVERALL (n=137)	15	23	20	22	15	4	51[d]	62[d]	42[e]
Secondary									
Full integration (n=12)	17	58	0	17	8	0	41	61	67
Itinerant help (n=15)	0	27	53	13	7	0	47	68	70
Partial integration (n=11)	0	9	9	27	55	0	69	78	33
OVERALL (n=38)	5	32	24	18	21	0	51[d]	68[e]	58[e]
TOTAL	13	25	21	21	16	3	51	64	45

a. PTA, or Pure Tone Average, is the average of the hearing thresholds at 500, 1000, and 2000 Hz.
b. HTA, or High Frequency Average, is the average hearing threshold at 4000 and 8000 Hz.
c. An audiogram is classified as falling if HFA exceeds PTA by 15 or more points.
d. Difference among groups is significant. See notes 9, 10, 11, 12, & 13.
e. Difference among groups is not significant.

At the secondary level, partially integrated students had an average PTA of 69 db, which represents a significantly greater loss than that shown by students in the other two groups.[13] There were no other significant differences among groups at the secondary level.

Aural/Oral Functioning

Aural functioning was defined as performance on a language test in which the subject could only hear the speaker and could not see her face. Oral functioning was performance on a similar test while being able to both hear the speaker and see her face. There was a moderate relationship between PTA and both aural ($r = -.58$) and oral ($r = =.40$) functioning. There were likewise moderate relationships between HFA and both aural ($r = -.43$) and oral ($r = -.31$) functioning. In all cases the negative sign of the coefficient indicates that, as the loss increases, functioning declines.

Given these relationships, it should come as no surprise that there were differences among groups at the elementary level on both of these tests, since the groups have been seen to differ on both PTA and HFA. In both cases, students from the hard of hearing classes performed at a significantly lower level than students from the other two groups (see Table 2).[14 & 15] Fully integrated and students integrated with itinerant help had similar levels of performance. This is important in view of the fact that the latter group had a greater loss as measured by PTA. But even on the aural test, in which they had to rely solely on hearing, itinerant students performed at as high a level as did the fully integrated students with more hearing.

For each student we computed a lipreading score, which indicates the proportion of total oral functioning which is due to lipreading ability. This was computed as the difference between the

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13 PTA (secondary) - Integrated vs. Segregated
$F = 17.196$; $df = 1/36$; $p \leq .05$; $r^2 = .32$.

14 Aural Functioning (elementary) - Integrated vs. Segregated:
$F = 9.147$; $df = 1/153$; $p \leq .05$; $r^2 = .06$.

15 Oral Functioning (elementary) - Integrated vs. Segregated:
$F = 19.530$; $df = 1/153$; $p \leq .05$; $r^2 = .11$.

oral and aural functioning score, divided by the oral score. This score averaged .11, with no significant differences among groups. The average indicates that students in all groups derived about 11% of their total functioning from lipreading.

There were no differences among the groups of secondary students in either aural or oral ability comparable to the differences at the elementary level between the hard of hearing class students and the other two groups. This may be because the secondary students constituted a more select group. Secondary students who function at a level comparable to hard of hearing class students may not even be placed in a partially integrated programme in a 4 - 5 year high school. There were also no differences among groups at the secondary level in lipreading ability.

It must be mentioned that scores on these two tests were quite high. On aural functioning, the average score was 17 out of 22 correct or about 77%. On oral functioning the average score was 19 correct out of 22 or 86%.

Now these tests have not been normed for either a hearing impaired or a normal population, so that it is difficult to really say that these scores represent a high or low level of functioning. But it is our belief that a normally hearing child would score close to 100% on the test. The scores obtained by the children in the sample indicate that they comprehended the vast proportion of what was said to them. Thus, the children in the sample had a fair amount of residual hearing, even those whose PTA's would categorize them as severely or profoundly deaf. However, testing was under better conditions than would obtain in a normal classroom. The tester chose a quiet room; there were no other people present; and the subject was engaged in no other tasks at the time. Thus, the scores represent how much the children were capable of comprehending aurally and orally under optimal conditions, rather than how much they do in fact understand in more natural situations.

Hearing Aid History and Use

Overall, 30% of the sample never had a hearing aid. An additional 22% did not wear their aids, although they had one. Hearing

TABLE 2

AURAL, ORAL AND LIPREADING ABILITY
FOR THE TOTAL GROUP AND BY PROGRAMME
AND GRADE LEVEL

	Aural Functioning	Oral Functioning	Lipreading[a] Ability
Elementary			
Fully integrated	18.2	19.6	.086
Itinerant help	17.0	19.3	.141
Hard of Hearing classes	14.9	17.1	.144
OVERALL	17.1[b]	19.0[b]	.115[c]
Secondary			
Fully integrated	20.3	21.3	.048
Itinerant help	17.9	20.2	.118
Partially integrated	17.6	20.5	.159
OVERALL	18.6[c]	20.6[c]	.109[c]
TOTAL	17.4	19.3	.113

a. Lipreading ability represents the proportion of oral functioning due to lipreading, and is calculated as (oral - aural)/oral.

b. Differences among groups are significant (see notes 14 and 15).

c. Differences among groups are not significant.

aid use varied by programme, and generally decreased as integration increased. In the elementary panel, as one moves from hard of hearing classes to itinerant help to full integration, hearing aid use at home declined from 68% to 50% to 32%. The remainder, an average of 24% over all programmes, had aids but did not typically use them[16] at home. In school, children in hard of hearing classes used aids more than children in the other two groups (89% vs. 55%).[17]

There was a similar pattern at the secondary level. Current use of an aid at home declined from 82% in the case of the partially integrated to 50% of the other two groups.[18] Those never having an aid rose from 0% to 36%. Hearing aid use at school declined from 100% to 71%.[19]

This difference among programmes in hearing aid use relates to severity of loss. Overall there was a strong relationship between PTA and use of a hearing aid, with higher use among those with greater losses. In fact, when this relationship is taken into account, there is little remaining difference among the students in various programmes in the number using a hearing aid at home.[20] Generally speaking, students in the less integrated programmes made more use of an aid simply because they had greater losses. For many of the children in our sample, a hearing aid would not even be prescribed. Children in hard of hearing classes did make greater use of their aid in school than children in other programmes, even taking their greater losses into account.[21] However, the difference in hearing aid use between

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16 On use vs. non-use of an aid at home, results are as follows:
Integrated vs. Segregated (elementary) - $F = 9.744$; $df = 1/150$; $p \leq .05$; $r^2 = .06$.
Intinerant vs. Fully integrated (elementary) - $F = 3.955$; $df = 1/116$; $p \leq .05$; $r^2 = .03$.

17 On use vs. non-use of an aid at school, results are:
Integrated vs. Segregated (elementary) - $F = 13.959$; $df = 1/144$; $p \leq .05$; $r^2 = .09$.

18 Use of an aid at home (secondary) - Integrated vs. Segregated:
$F = 3.425$; $df = 1/37$; $p \leq .05$; $r^2 = .08$.

19 Use of an aid at school (secondary) - Integrated vs. Segregated:
$F = 3.529$; df 1/15; $p \leq .05$; $r^2 = .19$.

20 PTA accounts for 41% of the variance in hearing aid use at the elementary level and 24% at the secondary level.

21 Hearing aid use at school corrected for PTA (elementary) - Integrated vs. Segregated: $F = 3.678$; $df = 2/127$; $p \leq .05$; $r^2 = .02$.

students who were integrated with itinerant support and those who were fully integrated was due solely to differences in hearing loss. The same was true for differences in hearing aid use at the secondary level. It remains to be determined whether or not children in the more integrated programmes who were not using aids at the home might benefit from making greater use of them.

The age at which the hearing loss was diagnosed and the age at which an aid was first fitted did not vary from programme to programme. Children in the elementary panel were diagnosed, on average, at 4.4 years of age and received an aid, for those who had one at 5.0 years. Secondary students were diagnosed, on average, at 5.4 years of age, and received an aid at 6.3 years.

Elementary students, as a group, had their loss recognized at an earlier age than students who were then in secondary school.[22] Presumably this represents an improvement in medical and educational services in the intervening years. It is surprising, however, that diagnosis continues to be relatively late, not usually occurring until the child enters school at age 4 or 5. In the case of children from the hard of hearing classes or those who were only partially integrated, one might expect diagnosis to have occurred at an earlier date since their losses were more severe, and thus more noticeable. Diagnosis did, in fact, occur somewhat earlier for children with a greater loss. However, the relationship was only a moderate one ($r = .37$), and was not sufficient to result in a difference between programmes. We will see later whether or not age of diagnosis and age at which a hearing aid is fitted relate to the child's latter success.

Age

Students in the various programmes varied somewhat by age. Elementary children receiving itinerant help were older (11.4 years) than those who were fully integrated (10.6) or in segregated classes (10.4).[23] This is because some children were integrated out into a

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22 Age of diagnosis - Secondary vs. Elementary:
$F = 4.246$; $df = 1/183$; $p \leq .05$; $r^2 = .02$.

23 Age (elementary) - Itinerant vs. Fully Integrated:
$F = 3.450$; $df = 1/116$; $p \leq .10$; $r^2 = .03$.

regular school with itinerant help after receiving a few years of more intensive, specialized training, and having given evidence that they were likely to succeed. At the secondary level, children in the itinerant programme were also somewhat older than those who were fully integrated.[24]

IQ

There was no difference in non-verbal intelligence as measured by the Hiskey-Nebraska by either programme or grade level. The sample as a group averaged an intelligence quotient of 103 with a standard deviation of 15. Thus, this group was normal with respect to the level and distribution of intelligence.

Language Background

There were few differences by programme or level in the extent to which students came from New Canadian backgrounds. Overall 87% were born in Canada and 77% were English speaking. Seventy-six per cent (76%) of the parents use only English with their children. This means that there were approximately 25% New Canadians in the sample. Their presence will allow us to look at the effect of a second language background on educational achievement.

There were somewhat fewer New Canadians in the itinerant group at the elementary level (93% born in Canada and 88% with an English background).[25]

Home Environment

There were some differences among programmes in the extent to which parents might be able to provide educational support to their children. At the elementary level, mothers of fully integrated children were more highly educated than those receiving itinerant help.[26]

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24 Age (secondary) - Itinerant vs. Fully Integrated: $F = 3.790$; $df = 1/27$; $p \leq .05$; $r^2 = .12$.

25 Language Background (elementary) - Itinerant vs. Fully Integrated: $F = 4.549$; $df = 1/116$; $p \leq .05$; $r^2 = .04$.

26 Mother's education (elementary) - Itinerant vs. Fully Integrated: $F = 2.700$; $df = 1/114$; $p \leq .05$; $r^2 = .02$.

Parents of these children also had more contact with their child's school.[27] Parents of children in both integrated groups gave more help at home to their children than parents of children in the hard of hearing classes.[28]

However, there were no differences at the elementary level in the educational level of the father, in how far parents felt their child was likely to go in school, or in the degree of professional help they had obtained for the child outside of school.[29]

At the secondary level, fathers of the partially integrated children had gone farther in school. This is probably a random sampling bias with no significance.[30] There were no other differences among secondary students.

On the basis of the elementary data, it is tempting to conclude that greater parental sophistication and involvement is partly responsibile for the child's ability to be integrated. We will see later whether or not this is the case.

Sex

There were no differences in the proportion of males and females in the various programmes. Males and females were fairly equally represented throughout.

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27 A scale was constructed to represent parents' report of their contact with the school during the current year. The scale is as follows: (0) none, (1) talked to teacher by phone, (2) phoned teacher on own initiative, (3) attended parents' night or other school programme, (4) visited the school, (5) visited school on more than one occasion, (6) continually visits the school. Parents of both elementary and secondary students scored an average of 3 points. Parents of elementary children who were fully integrated average 3.5 points; Itinerant vs. Fully Integrated: $F = 14.565$; $df = 1/112$; $p \leq .05$; $r^2 = .12$.

28 The question asked was: "Does (child) require any special help from you or other members of the family because of his hearing handicap, like extra help with homework, pronunciation, or anything like that"? It was coded as: (0) no particular help, (1) help as might be provided by any parent to a child, (2) exceptional degree of help. Integrated vs. Segregated (elementary): $F = 3.340$; $df = 1/150$; $p \leq .10$; $r^2 = .02$.

29 Parents were asked about the professional help they had engaged - speech teachers, tutors, etc. - and the number who had seen the child was merely counted. There was no attempt to assess the intensity or quality of that help.

30 Fathers' education (secondary) - Integrated vs. Segregated: $F = 3.342$; $df = 1/37$; $p \leq .10$; $r^2 = .08$.

Summary

Students in different programmes differed mainly in terms of hearing loss. At both the elementary and secondary level, there was a general decrease in hearing level as one moves along a continuum of programmes from more to less integration.

Elementary students in hard of hearing classes performed less well on functional measure of aural and oral language ability than students in the two integrated groups. There were no differences between fully integrated students and students integrated with itinerant help at the elementary level, and at the secondary level there were no differences between any of the groups.

There were differences among groups on hearing aid history which were due mainly to differences in the extent of hearing loss. In general the more severely impaired groups showed a higher degree of use. However, teachers of children in the hard of hearing classes reported a higher degree of hearing aid use in school, a level which was even disproportionate to the greater loss of children in this group. It is reasonable to assume that the higher rate of use is due to the continual presence of a specially trained teacher.

There were no group differences on age of diagnosis and fitting with an aid, on IQ, or on country of birth. However, children at the elementary level who were receiving itinerant help more often came from English speaking backgrounds. By and large there were also no differences in home environment, although there was some indication at the elementary level that integrated children had parents who were more directly supportive of the educational programme.

These differences between groups will have to be taken into account when attempting to assess the relative effectiveness of the various alternatives.

V -- WHAT ARE THE VARIOUS PROGRAMMES LIKE?

Educational History

Children came to the various programmes from different educational backgrounds, and once they were there, they were presented with different educational alternatives.

Few children in the sample (16%) had had preschool experience. However, at the elementary level, more children (28%) in hard of hearing classes had been to preschool than children in the other two groups (13%).[31] At the secondary level the pattern was different. Even fewer students overall (8%) had been to preschool, but those who had were currently fully integrated without itinerant help. However, even of this group, only 25% had been to preschool.[32]

In general, the more segregated child had a more variable school history. Elementary school children in the sample had been in school, excluding any years in preschool or kindergarten, an average of 5.2 years. During that time the average child from a hard of hearing class had been in two different kinds of programmes, and had made almost one change in either programme or school per year (see Table 3). Some of these children had previously been in regular programmes; some had been in schools for the deaf.

Children who were fully integrated or integrated with itinerant help had also experienced some changes in schools and programmes, but to a lesser extent than children in hard of hearing classes.[33] Most of these children had always been in the same programme; they averaged only 1.3 or 1.4 <u>different</u> placements.[34] Some had previously been in

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31 Years in preschool (elementary) - Integrated vs. Segregated: $F = 4.857$; $df = 1/153$; $p \leq .05$; $r^2 = .03$.

32 Years in preschool (secondary) - Itinerant vs. Fully Integrated: $F = 5.276$; $df = 1/27$; $p \leq .05$; $r^2 = .16$.

33 Total number of school or programme changes (elementary) - Integrated vs. Segregated: $F = 25.125$; $df = 1/146$; $p \leq .05$; $r^2 = .15$.

34 Number of programme changes (elementary) - Integrated vs. Segregated: $F = 9.026$; $df = 1/146$; $p \leq .05$; $r^2 = .06$.

a school for the deaf or in a hard of hearing class, but that was not the norm. On the average, children in these two groups had spent about 80% of their school experience, or about five years, in a regular classroom.[35] Fully 73% of the children had always been in a regular class.

Children in the itinerant programme had been receiving itinerant help for approximately two years, or only about one-half of the time they had been in a regular programme. Thus, most had been in a regular class for some period of time before being referred for special help. They did not, by and large, come from the hard of hearing classes. Included in this group, however, are the students from the Drury school who had only recently been integrated into regular schools (see pp. 16-17).

The secondary students in our sample had been in school for about ten years. There was a difference by programme in the number of school and programme changes they had undergone. Once, again, partially integrated students were more mobile. Students in this group changed programmes or schools almost every year, while students in the other two groups only changed about one every two years.[36] There was no difference between groups in the number of different programmes they had been in.

Fully integrated students and those receiving itinerant help had been in regular classes for about seven years, or roughly 70% of their school life. Itinerant students had received itinerant help for about four years, or roughly 60% of that time. Thus, they too, like the elementary students in an itinerant programme, had been in regular classes for some period of time without receiving any specialized help.

The Role of the Itinerant Teacher

Children at the elementary level who were receiving itinerant help had been receiving it for about two years, and secondary students for about four years. The most important function of the

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35 Proportion of time in a regular class (elementary) - Integrated vs. Segregated: $F = 134.484$; $df = 1/146$; $p \leq .05$; $r^2 = .48$.

36 Total number of school or programme changes (secondary) - Integrated vs. Segregated: $F = 12.870$; $df = 1/36$; $p \leq .05$; $r^2 = .26$.

TABLE 3

EDUCATIONAL HISTORY BY PROGRAMME AND LEVEL FOR ELEMENTARY AND SECONDARY STUDENTS

	Group							
	Elementary				Secondary			
	Fully Integrated	Itinerant Help	Hard of Hearing Classes	Overall	Fully Integrated	Itinerant Help	Partially Integrated	Overall
Percent with preschool experience	13	12	28	16	25	0	0	8
Number of years in school	5.1	5.9	4.8	5.2	9.5	10.2	9.9	9.9
Number of different programmes	1.3	1.4	1.7	1.4	2.1	2.5	2.5	2.4
Number of school or programme changes per year	.56	.56	.91	.64	.46	.62	.86	.65
Proportion of time in regular classes	.85	.75	.15	.65	.73	.70	.07	.53
Teacher knowledge scores	19.8	22.7	26.3	22.2	18.3	19.7	24.0	20.5

itinerant teacher seems to be interacting with the regular classroom teacher to help improve her programming for the child. Itinerant teachers often have to take an active role in this process. For 57% of the students, itinerant teachers reported that they had to initiate interaction with the regular teacher. In 33% of the cases, the teachers themselves approached the itinerant teacher with problems and questions. In the remaining 10% of the cases, no such interaction between the itinerant and regular teacher occurred at all.

Itinerant teachers also spend a great deal of their time in the guidance and counselling of students. Over half (52%) of the students had been given such help by the itinerant teacher. The remainder of the itinerant teacher's work is mostly related to language training. Thirty-six per cent (36%) of the students had received help with language per se, 26% had received auditory training, and 30% had received help with speech.

Relatively little time is spent in direct tutoring of specific subjects. Only 4% had received help in math, 10% in spelling, and 10% in reading.

Twenty per cent (20%) of the students were not receiving any direct help at all at the time of the study. With these students the role of the itinerant teacher was one of follow-up, periodic checking to make sure that the student was continuing to make satisfactory progress in his or her work.

The Regular Classroom Teacher

Most regular classroom teachers (86%) were aware of their student's impairment. This was true regardless of whether or not the student was integrated with itinerant help. Teachers were more aware of their student's problem at the elementary (93%) than at the secondary level (74%). Furthermore, most elementary (70%) and many secondary (49%) teachers felt that the student had some difficulties in class because of their handicap.

Most of these difficulties related to communication problems of one type or another. There were few reports of academic difficulties,

discipline or social problems. Many regular teachers at the elementary level reported having some difficulty teaching the child. More teachers of children receiving itinerant support reported problems (67%) than teachers of the fully integrated (42%). Relatively few secondary teachers reported problems (20%).

In recognition of these difficulties, most regular teachers reported making some modifications in their general approach to the child. On average, the teachers replied with about two modifications. On average, teachers of the hard of hearing classes reported fewer modifications, probably because all of their students required similar specialized attention; in a special education class, specialized help is the norm.[37] There were no other differences between groups at either the elementary or the secondary level in the number of modifications made by teachers. We might have expected itinerant teachers to be instrumental in helping the regular teachers modify their approach, but there are limitations to the type of self report instrument we used, and a more in-depth study of this area might have uncovered differences between teachers who were receiving specialized help and those who were not.

Table 4 lists the various modifications used by teachers in order of occurance. As can be seen from the table, teachers made an extra effort to help the child understand what is said in class as well as to give him or her extra attention.

Teachers were given a test covering basic principles of hearing loss and the classroom management of the hearing impaired child. At the elementary level, teachers of the hard of hearing classes earned higher scores than the other two groups, and teachers receiving itinerant services scored higher than those not receiving such services.[38 & 39]

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37 Number of teacher modifications (elementary) - Integrated vs. Segregated: $F = 12.351$ $df = 1/146$; $p \leq .05$; $r^2 = .08$.

38 Teacher Knowledge scores (elementary) - Integrated vs. Segregated: $F = 46.520$; $df = 1/147$; $p \leq .05$; $r^2 = .24$.

39 Teacher Knowledge scores (elementary) - Itinerant vs. Fully Integrated: $F = 10.945$; $df = 1/111$; $p \leq .05$; $r^2 = .09$.

TABLE 4

PER CENT OF TEACHERS REPORTING USE OF VARIOUS MODIFICATIONS WITH THE HEARING IMPAIRED CHILD

Modifications	Percentage[a]
Careful Enunciation	45
Seating in front of the class	41
More individual attention	32
Additional tutoring by teacher	29
Speaking more loudly	25
Assigning a buddy	18
Tutoring by someone else	16
Less attention to encourage independence	6

a Percentages add up to more than 100% because many Teachers reported more than one item.

At the secondary level, regular teachers of partially integrated students scored higher than teachers of the other two groups.[40] There were no differences between the teachers of fully integrated and teachers of itinerant students.

Table 5 lists the questions, and gives the overall percentage of teachers scoring correctly for three different groups: teachers who had formal training in hearing impairment (elementary teachers of hard of hearing classes), teachers with some informal training (elementary and secondary teachers of students receiving itinerant support and secondary teachers of the partially integrated), and teachers without specialized training of any type who had had experience with hard of hearing children (elementary and secondary teachers of the fully integrated).

40 Teacher Knowledge (secondary) - Integrated vs. Segregated: $F = 10.870$; $df = 1/36$; $p \leq .05$; $r^2 = .23$.

In addition to these teachers we drew a random sample of teachers from Toronto and Kingston to see how much teachers who had no exposure at all to hearing impaired children would be aware of their problems. These teachers scored significantly lower as a group than the teachers of the hearing impaired children.[41] The scores for this group are also given by item in Table 5; the heading for this group is "unexperienced and untrained."

There was quite a bit of resistance to this questionnaire by teachers in the random sample. Some objected to the true-false format of the test, a format which we ourselves were not very happy with, but had adopted for practical reasons. But, in addition, many teachers seemed to object to being asked questions about hearing impairment in any format. They seemed to feel that such specialized knowledge should not be required of them, and that it was even inappropriate to test how much they did or did not know. As a result, our response rate for this group was rather low (54%), and we suspect that the teachers who did reply are perhaps more knowledgeable than those who did not.

It is interesting to compare the scores earned by teachers of fully integrated students with the scores of teachers who had had no experience with hard of hearing children. The interesting point is that there is virtually no difference between the two groups. In fact, the latter group more often outperformed the former group than vice versa. However, this was probably due to the fact that in the random sample, the more knowledgeable people were more likely to return the questionnaire. The conclusion to be drawn is that regular classroom teachers learn very little from mere exposure to a hearing impaired child. Specialized training of some sort is required in order for teachers to become knowledgeable in this area.

It is very difficult to compare scores to specific questions. Some questions may have had a high hit rate merely because the wording made the correct answer more obvious. Nevertheless, it is probably not inappropriate to look at the overall scores for sets of questions which are grouped by topic. Table 5 presents the items by topic.

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41 Teacher Knowledge (elementary and secondary) - Teachers with hearing impaired children vs. teachers without:
$F = 9.546$; $df = 1/350$; $p \leq .05$; $r^2 = .03$.

TABLE 5

TEACHER SCORES BY ITEM ON THE TEACHER KNOWLEDGE QUESTIONNAIRE

Fact Tested	Teacher Group			
	Formally[a] Trained	Informally[b] Trained	Experienced[c] but Untrained	Unexperienced[d] and Untrained
A) Physiology of hearing loss-	86	49	35	40
1. A child with a high frequency loss is more likely to hear vowels than consonants.(T)				
2. A child with a loss of 60db can discriminate only 40% of speech sounds.(F)	69	33	21	22
3. A sensory-neural loss is a temporary impairment resulting from infection or wax build-up in the ear.(F)	92	71	50	57
4. A hearing loss of 25-35db (ISO) is considered moderate.(F)	39	36	9	15
OVERALL	72	47	29	34
B) Listening performance -				
5. Listening is a more physically tiring activity for the hearing impaired than the normal child.(T)	86	89	92	92
6. Weather and minor illness may temporarily compound a child's hearing loss.(T)	100	96	88	90
7. Hard of hearing children are more distracted by background noise than are normally hearing children.(T)	83	54	50	44
OVERALL	90	80	77	75

Table 5 cont'd.

Fact Tested	Teacher Group: Formally[a] Trained	Informally[b] Trained	Experienced[c] but Untrained	Unexperienced[d] and Untrained
C) Hearing aid performance -				
8. One of the problems with hearing aids is that background sounds are picked up to the same degree as speech sounds.(T)	92	67	74	71
9. Hearing aids for the hard of hearing and the deaf are as effective as are glasses for the partially sighted.(F)	75	41	55	57
10. A hard of hearing child who uses a hearing aid can hear as well from the back as from the front of the room.(F)	75	89	69	77
11. A hearing loss can usually be completely overcome by proper amplication.(F)	92	83	68	80
12. After a little instruction, a classroom teacher should be able to do simple repairs on a hearing aid.(T)	78	43	30	23
OVERALL	82	65	59	62
D) Effects on educational development and language performance -				
13. Hearing impairment typically results in as much of a decrement in performance I.Q. as in verbal I.Q.(F)	72	63	53	51
14. Hearing impaired children will sometimes pretend to have understood when they have not.(T)	100	100	92	93

Table 5 cont'd.

Fact Tested	Teacher Group: Formally[a] Trained	Informally[b] Trained	Experienced[c] but Untrained	Unexperienced[d] and Untrained
15. Congenitally hard of hearing and deaf children often have a natural aptitude for visual tasks like lipreading.(F)	56	56	33	48
16. Even with the best of teaching, the hard of hearing child will have a limited vocabulary compared to his normally hearing peers.(T)	86	44	34	36
17. The hard of hearing child will not be as adept at note-taking as other children.(T)	44	39	42	46
18. It is always possible to predict how successful a hearing impaired child will be in school from the extent of his hearing loss.(F)	100	91	92	95
19. If no educational treatment is provided, deafness is more likely to result in retarded language development than other forms of physical impairment like blindness or cerebral palsy.(T)	92	73	58	72
20. Normally hearing children generally learn new words almost unconsciously by repeatedly encountering them in everyday speech.(T)	100	97	88	95
21. Hard of hearing children may either speak too loudly or too softly.(T)	94	89	93	84
OVERALL	83	72	65	69

Table 5 cont'd.

Fact Tested	Teacher Group: Formally[a] Trained	Informally[b] Trained	Experienced[c] but Untrained	Unexperienced[d] and Untrained
E) Classroom Management -				
22. The hard of hearing child should be given a special seat where he has an unobstructed view of the teacher's face.(T)	97	84	89	84
23. The hard of hearing child should be positioned within the room so that he can view his classmates' as well as his teacher's face.(T)	92	84	85	83
24. The hard of hearing child should not be expected to attempt the same speaking assignments as other children.(F)	94	77	75	68
25. It is somethimes necessary to repeat for the hard of hearing child what another child says in class.(T)	100	94	86	90
26. When a hard of hearing child is integrated into a regular class, it is usually better if his classmates are told about his handicap.(T)	100	63	58	66
27. The hard of hearing child should be encouraged to check with the teacher whenever he is unsure that he has understood.(T)	94	100	99	96
28. If a hard of hearing child doesn't understand, the teacher should repeat the same thing louder and more slowly until he does understand. (F)	56	47	26	46

Table 5 cont'd.

Fact Tested	Teacher Group: Formally[a] Trained	Informally[b] Trained	Experienced[c] but Untrained	Unexperienced[d] and Untrained
29. Visual aids should never be used because hearing impaired children need to learn to concentrate on auditory cues.(F)	100	97	92	93
30. Slang and idioms should not be used with hard of hearing children.(F)	92	89	79	78
31. It is helpful to the hearing impaired child if the teacher writes what he/she says on the blackboard.(T)	92	81	74	77
OVERALL	92	82	76	78
GRAND TOTAL	85	72	64	67

a Elementary teachers of the hard of hearing classes.

b Teachers of elementary and secondary children receiving itinerant support plus secondary teachers of the partially integrated.

c Regular classroom teachers of fully integrated children.

d Regular teachers without hard of hearing children in their class.

The topic headings were not included in the questionnaires sent to teachers, in fact the various sets of questions were scrambled. But they are presented here by topic in order to facilitate the discussion.

The first group of questions concerns various technical facts about the physiology of hearing loss and the manner in which it is measured. Untrained teachers scored lowest on this group of questions. Informally trained teachers did better, and formally trained teachers better still. However, there is one item (4) on which even the formally trained teachers did poorly. But it is questionable whether any of these items, especially item no. 4, has practical relevance to the teacher in the classroom.

All four groups of teachers did well on the listening performance aspect of hearing impairment. Everyone seemed to know that attempting to hear can be physically tiring to a hearing impaired child, and that his or her functioning is somewhat variable from day to day and time to time depending on the weather and the child's general state of health. Conductive losses especially vary with the weather. However, true and false questions can be very misleading. We cannot really conclude from a high score on a question of this type that a teacher will really be able to bring this information to bear on her interaction with a child. Concluding this set, there is one item which was widely known only among formally trained teachers, and that is the distracting effect of background noise.

Quite a few untrained teachers tended to overestimate the effectiveness of a hearing aid. Many were also unaware, as were those who were informally trained, of the problem of background noise. Performance of the teachers on this section suggests that the high scores on the two listening performance questions discussed above (5 and 6) may have occured because of the wording of those questions rather than the knowledge of the teacher. If almost all teachers truly recognized the variability of hearing performance within an individual, why would a substantial minority believe that hearing aids completely remediate the handicap?

All four groups of teachers tended to underestimate the effects of a hearing loss on language development. Even most hard of hearing teachers did not recognize that notetaking, as a type of English language activity, will be affected by a handicap which retards oral language development. It is interesting that many teachers did not know the difference between performance and verbal IQ. Evidently, they believe that all learning occurs thru and is manifested in language. Finally it is surprising that so many succumbed to the myth that handicapped people have natural compensating abilities in other areas. However, the wording of question (15) may have been somewhat ambiguous.

In spite of the dramatic lack of knowledge in some areas, teachers' awareness of classroom management techniques was uniformly high. At least when presented with the idea, teachers seemed intuitively to appreciate the value of having a hearing impaired child see the speaker's face (22,23), using visual aids (29,31), using natural language (30), repeating what is said in class (25), and

encouraging the child to take an active role in requesting repetition when he or she fails to understand what is said (27). However, very few appreciated the value of rephrasing what has been said when a child fails to understand. Informally trained and untrained teachers seemed to have a tendency to protect the hearing impaired child. Quite a few would not tell the others in the class about the problem, nor would they require the same speaking assignments of them.

We would like to emphasize at this point the limited nature of the instrument that was developed to assess teacher knowledge. Not only was the format limited, but some of the items are open to dispute. We take refuge in the fact that most formally trained teachers agreed with our interpretation of the facts. Nevertheless, the results should only be interpreted with caution. What we probably can conclude with safety is that teachers in contact with the hearing impaired do require special training, and the area in which the level of knowledge is lowest is the functional limitations of hearing aids and the effect of a loss on general language development.

Teachers were also given an attitude test. There were no differences by group or level on attitudes toward the hearing impaired. As a group, these teachers expressed a level of acceptance which is close to that typically shown toward disabled persons. However, the research of Schrodel, Siller, and others on attitudes toward the deaf suggests that the type of measure we used may have been too general and superficial.[42]

Use of Other Professionals

The itinerant teacher is not the only special resource person who aids the integrated hearing impaired child. School systems also provide personnel who are expert in other areas - psychologists, remedial teachers, etc. At both the elementary and secondary level, integrated students had more contact with other professionals than segregated students.[43]

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42 VIIth World Congress of the World Federation of the Deaf, Commission on Psychology, August 4, 1975, Washington, D.C.

43 Number of professional resources used (elementary) - Integrated vs. Segregated: $F = 2.943$; $df = 1/151$; $p \leq .05$; $r^2 = .02$.
Number of professional resources used (secondary) - Integrated vs. Segregated: $F = 4.214$; $df = 1/38$; $p \leq .05$; $r^2 = .10$.

As a very crude measure of this help, we counted each professional in addition to the classroom or itinerant teacher with whom the child had contact during the year of the study. At the elementary level, children in hard of hearing classes averaged .4 such contacts. Fully integrated children averaged .7 and children integrated with itinerant support averaged .6. The latter two groups do not differ significantly.

Likewise, at the secondary level, fully integrated students and those integrated with itinerant support averaged .4 and .3 contacts a year, respectively, and partially integrated students had none. Therefore, to a certain extent, removal of a child from a segregated setting is to replace one type of specialized help with another.

The most frequently used of these other resource persons was the speech teacher. One-third of the elementary children had received her help - 17% of those in hard of hearing classes, 30% of those integrated with itinerant help, and 42% of those who were fully integrated. At the secondary level, none of the partially integrated, two of the 17 itinerant students, and three of the 12 fully integrated were receiving this help.

The reading teacher was also of some importance. At the elementary level, 18% of children in hard of hearing classes, 17% of those receiving itinerant help, and 14% of the fully integrated, were receiving this type of help. At the secondary level, only one itinerant and one regular student were seeing a reading teacher.

Summary

Children in the various programmes not only came from different backgrounds, but they had different educational histories as well. Very few of the children in the sample had had preschool experience. At the elementary level it was the child in a hard of hearing class who was most likely to have gone to preschool, while at the secondary level, all of the students with preschool experience were fully integrated.

In general, the more segregated children had a more mobile school history than those who were integrated. Elementary students who were in hard of hearing classes and secondary students who were

partially integrated had changed programmes and schools more often than their fully integrated and itinerant-integrated peers.

Most of the children who were fully integrated or integrated with itinerant help had always been in a regular classroom. Children receiving itinerant help had only done so for only about half the time they had been in an integrated placement. Thus, most children who were integrated had always been integrated, and even those singled out for itinerant help had survived for quite a long time without it. This is another indication of the lesser degree of impairment of the integrated as opposed to the more segregated students.

The role of the itinerant teacher is primarily one of advising regular teachers as to the classroom management of the hearing impaired child and giving counsel and advice to the students themselves. Various types of language training are also important, but very little direct tutoring in specific subject matter occurs.

The effect of this specialised help is seen in the fact that regular teachers who were in contact with an itinerant knew more about hearing impairment than those who were not. Mere exposure to a hearing impaired child did not raise a teacher's level of knowledge about the handicap or its management. Special training of some sort is required. The areas in which teachers' lack of knowledge was most dramatic is the functional limitations of hearing aids and the effect of a hearing loss on general language development. All teachers scored high on classroom management techniques.

Most teachers with hearing impaired children in their class reported making some programme modifications in order to better accommodate the child. The most frequent modifications represent attempts to help the child understand what is said in class - careful enunciation, seating in front of the class, and speaking more loudly. Teachers also frequently give hearing impaired children more individual attention and additional tutoring.

Hearing impaired children who were integrated also received more help than segregated children from other school professionals - most notably the speech teacher and the reading specialist.

VI -- HOW EFFECTIVE ARE THE VARIOUS PROGRAMMES?

Levels of Academic Achievement

In order to describe educational achievements, it is necessary to convert grade point averages to age equivalents. This was done for the reading and language tests by adding "6", the age at which children generally enter first grade, to the grade equivalent score and subtracting the real age. This yields a discrepancy score which describes how a child performs relative to his or her age-mates. For example, if a nine year old girl has progressed normally through school, she should be in third grade, and should receive a grade equivalent score of about '3'. If she does, her discrepancy score is (6.0 + 3.0 - 9.0) or 0.0, indicating that she is neither above nor below her peers. However, if her grade equivalent score is only 2.7, her discrepancy score would be -.3, indicating that she is about three months behind her agemates.

Table 6 gives the average discrepancy scores in reading and in language by programme. Scores on both these tests are highly correlated at both the elementary ($r = .75$, $p \leq .001$) and secondary ($r = .62$, $p \leq .001$) level. Thus children who do well on one test are likely to do well on the other, and vice versa. At the elementary level, the pattern is very clear. Fully integrated children were performing somewhat above what would be expected for their age - about half a year in reading and a month or two in language. Children receiving itinerant help were 1/3 of a year behind in reading and 3/4's of a year in language. Children in hard of hearing classes were one year behind in reading and almost two years behind in language.

It is not really appropriate to use these data to make hard comparisons between hard of hearing children and normally hearing children in the Province. The California tests have not been standardized in Ontario, and although we would not expect the norms to be too different, they could easily be off by a half year or so. What we can say, however, is that children in hard of hearing classes were about a year behind those who were integrated with itinerant help, and these children in turn were about a year behind those who were integrated without any special support services.

TABLE 6

DISCREPANCY SCORES IN READING AND LANGUAGE AND SPEECH INTELLIGIBILITY SCORES BY PROGRAMME

Group	Reading[a]	Language[a]	Speech Intelligibility[b]
Elementary			
Fully Integrated (n=77)	0.51	0.14	4.73
Itinerant Help (n=41)	-0.30	-0.78	4.21
Hard of Hearing Classes (n=36)	-1.07	-1.78	3.39
OVERALL	-0.07	-0.55	4.26
Secondary			
Fully Integrated (n=12)	-0.10	0.43	5.33
Itinerant Help (n=17)	-1.35	-1.58	5.21
Partially Integrated (n=11)	-1.12	-1.58	4.70
OVERALL	-0.91	-0.98	5.10

a Discrepancy scores calculated as: Discrepancy score = Grade Equivalent + 6.0 - age. "Six" is the age at which children normally enter Grade 1. Thus this formula produces a number which describes how a child compares with normally hearing children of the same age.

b Speech Intelligibility was rated on a 7 point scale as described on page 35.

At the secondary level, fully integrated students were scoring close to grade level, while the itinerant and partially integrated groups were a year to a year and a half behind.

However, we have already seen that the various groups differed in the extent of their hearing loss. Table 7 gives reading and language discrepancy scores at both the elementary and secondary level by severity of loss, as measured by PTA. Notice that at the elementary level, there is a general downward trend in both reading and language as PTA increases. This trend is not perfect since it is seen that children who have severe and profound losses are doing better than children with lesser degrees

TABLE 7

DISCREPANCY SCORES IN READING AND LANGUAGE AND SPEECH INTELLIGIBILITY SCORES BY SEVERITY OF LOSS (PTA)

Group	Reading[a]	Language[a]	Speech Intelligibility[b]
Elementary			
Normal (0-25 db) (n=21)	0.81	0.38	5.45
Mild (26-40 db) (n=31)	0.28	-0.11	4.95
Marginal (41-55 db) (n=28)	-0.36	-1.13	4.30
Moderate (56-70 db) (n=30)	-1.01	-1.74	3.50
Severe (71-90 db) (n=20)	-0.38	-0.57	3.40
Profound (90+ db) (n=6)	0.09	-1.44	2.50
OVERALL (n=136)	-0.16	-0.73	4.24
Secondary			
Normal (0-25 db) (n=2)	-1.11	0.69	6.00
Mild (26-40 db) (n=12)	-0.57	-0.91	5.64
Marginal (41-55 db) (n=9)	-0.65	-1.12	5.52
Moderate (56-70 db) (n=7)	-1.69	-1.82	4.83
Severe (71-90 db) (n=8)	-0.67	-0.61	4.04
OVERALL (n=38)	-0.85	-0.98	5.15

a See note (a) in Table 6.

b See note (b) in Table 6.

of impairment. This is a surprise, and suggests that the children in this group are not typical representatives of children with this degree of loss, but are unusual in some respect. We will return to look at this group specifically at a later point.

This group excepted, however, the relationship between hearing loss and achievement is still not very strong. The overall correlation coefficients between PTA and reading ($r = -.19$, $p \leq .02$) and between PTA and language ($r = -.20$, $p \leq .01$) are significant, but not very impressive. HFA has a similar level of relationship to reading ($r = -.30$, $p \leq .001$) and language ($r = -.27$, $p \leq .001$). This confirms again the widely held belief that it is difficult to predict a child's level of performance from knowledge of his or her hearing loss alone.

At the secondary level there was no discernible relationship at all between hearing loss and reading ($r = -.01$). There appeared to be some tendency for language scores to decline as PTA increased, but the relationship, as measured by a correlation coefficient, was not significant ($r = -.02$). There was also no relationship between HFA and either reading or language tests. This lack of a relationship between hearing loss and language ability at the secondary level probably reflects the fact that this is a very select group of students, who for one reason or another have managed to do well academically in spite of their handicap.

Our functional measures of hearing loss were a bit more useful. At the elementary level, aural functioning showed a significant but weak relationship to reading ($r = .19$, $p \leq .01$) and language ($r = .26$, $p \leq .001$). Oral functioning related only to language ($r = .16$, $p \leq .03$). These are about the same strength of relationship as exists between test performance and hearing loss as measured by PTA and HFA. However, in contrast to PTA and HFA, measures of aural and oral functioning were useful at the secondary level, and the relationships were stronger. Better aural functioning was associated with higher levels of reading ($r = .39$, $p \leq .01$) and language ($r = .37$, $p \leq .01$). Oral functioning was also related to reading ($r = .32$, $p \leq .02$) at the secondary level.

At the elementary level, reading and language scores were related to teacher ratings of general classroom functioning (reading: $r = .43$, $p \leq .001$; language: $r = .35$, $p \leq .001$) and classroom performance

in reading (reading: $r = .43$, $p \leq .001$; language: $r = .32$, $p \leq .001$). However, these relationships are not as high as might be expected, particularly the relationship between the standardized reading test and teacher ratings of performance in class.

A possible explanation for this discrepancy is that hearing impaired children are carefully placed in classrooms where they might succeed. If the placement is in a class where the group as a whole is not achieving at a very high level, a hearing impaired child who also is not working at age level might still be functioning well within that class. This explanation is supported by a comparison of the ratings given by regular classroom teachers to the fully integrated and itinerant groups. Although Table 6 shows itinerant children to be scoring lower in both reading and language than children who are fully integrated, their teacher ratings are virtually identical (3.3 vs. 3.4 in reading; 3.3 vs. 3.3 in general functioning). Thus we suspect that children receiving itinerant support have been placed in lower achieving classes.

At the secondary level there is no relationship at all between teacher ratings and test scores. This again is probably because we are dealing with a small, select group at the secondary level.

Speech Intelligibility

At the elementary level, speech intelligibility was related to reading ($r = .24$, $p \leq .002$) and language scores ($r = .27$, $p \leq .001$). This may indicate that some children were more difficult to understand because of poorly constructed sentences in addition to intelligibility problems *per se*. At the secondary level, there was no such relationship. Secondary students generally had somewhat higher scores for speech intelligibility than did elementary students (5.1 vs. 4.2), and it may be that all secondary students had a sufficient grasp of English so that it no longer interfered with speech intelligibility.

At the elementary level, speech intelligibility showed the same pattern of decline from fully integrated to itinerant help to hard of hearing classes as we have seen with reading and language scores (see Table 6). The speech of fully integrated children was almost all

intelligible; most, but not all, of what itinerant children said could be understood. At the secondary level, fully integrated and students receiving itinerant support had very high levels of intelligibility; almost everything they said could be understood. Partially integrated students scored a bit lower, but not a great deal.

Speech intelligibility shows a consistent pattern of decline with severity of loss at both the elementary and secondary level (see Table 7). At the elementary level the relationship is quite strong ($r = -.60$, $p \leq .001$), and speech declines from being usually completely intelligible in the case of those with normal hearing to somewhat less than half of the speech of the profoundly deaf being understood. The relationship is also strong at the secondary level ($r = -.65$, $p \leq .001$). The speech of students with normal hearing is completely intelligible while those with severe losses have quite a few words or phrases which cannot be understood. However, although these students are less intelligible than the rest, their speech is still quite good, with almost all of it being intelligible.

HFA also relates to speech intelligibility at both the elementary ($r = -.53$, $p \leq .001$) and secondary level ($r = -.68$, $p \leq .001$). At the elementary level aural ($r = .78$, $p \leq .001$) and oral ($r = .67$, $p \leq .001$) functioning show relationships to speech intelligibility that are at least as strong as those shown by PTA and HFA. At the secondary level, the relationships exist, but are smaller in size (aural functioning: $r = .39$, $p \leq .01$; oral functioning: $r = .38$, $p \leq .01$).

Levels of Adjustment

There was very little difference among programme groups at the elementary level in self concept. All three groups had scores close to 36 (see Table 8). At the secondary level, students integrated with itinerant help had somewhat higher self concept scores than either the fully or partially integrated groups. Unfortunately, norms do not exist for the scale, so we cannot say how the hard of hearing sample as a whole compares to normally hearing children. It is also inappropriate to compare elementary and secondary students with one another, since the scales differ.

Table 8 also gives scores on the Bristol Social Adjustment Guide. Low scores on this measure indicate better adjustment. At the elementary level, scores for the fully integrated and hard of hearing class groups were close to nine, while normal children should score about eight. However, this slight increase does not at all represent serious maladjustment, which would be indicated by a score of twenty or more. Children receiving itinerant help scored somewhat higher (i.e. lesser adjustment), but again the deviation from normal was not marked.

TABLE 8

SELF CONCEPT AND SOCIAL ADJUSTMENT
SCORES BY PROGRAMME

Group	Self Concept[a]	Social Adjustment[b]
Elementary		
Fully Integrated	36.9	8.5
Itinerant	35.9	10.8
Hard of Hearing	36.1	8.9
OVERALL	36.5	9.2
Secondary		
Fully integrated	19.5	4.3
Itinerant	24.8	4.8
Partially Integrated	19.3	3.4
OVERALL	21.7	4.2

a North York Self Concept Scale, elementary and secondary version.

b Bristol Social Adjustment Guides. A low score indicates good adjustment.

Students at the secondary level showed fewer signs of maladjustment than would be expected; seven is the normal score for this age group. Partially integrated students were somewhat better adjusted than the other two groups.

The poorer Bristol score for elementary children receiving itinerant help, and the better score at the secondary level attained by partially integrated students suggests that integration may have a detrimental effect on adjustment. This is born out by data on the relationship between hearing loss and both self concept and social adjustment.

At the elementary level, children with greater losses as measured by PTA and HFA had <u>better</u> scores on social adjustment (PTA: $r = -.13$, $p \leq .07$; HFA: $r = -.16$, $p \leq .03$). There was a similar relationship at the secondary level. Students with greater losses, as measured by HFA, had higher self esteem ($r = -.29$, $p \leq .06$) and better social adjustment ($r = -.26$, $p \leq .08$). These relationships can be seen, although not always clearly, in Table 9. They again suggest that integration has a detrimental effect on adjustment, since integrated children generally have a lesser degree of loss.

This pattern of relationships is all the more puzzling because integrated students at the elementary level generally had higher performance scores, and higher achievement is generally associated with greater self esteem and better social adjustment. At the elementary level, children who scored higher in language had greater self concept ($r = .18$, $p \leq .01$) and better adjustment ($r = -.14$, $p \leq .04$). Children scoring higher in reading were better adjusted ($r = -.17$, $p \leq .02$). However, at the secondary level, students scoring higher in reading and language were somewhat less socially adjusted (reading: $r = .24$, $p \leq .07$; language: $r = .25$, $p \leq .06$).[44]

However, the above relationships, which suggest that integration has detrimental social effects are all, although significant, very small. Furthermore, the situation is more complex than we have indicated here. Both achievement and social adjustment are affected by a whole host of factors, and to this point we have only looked at hearing loss and programme.

In Chapter IV we presented data to show that students in the various programmes differed in a variety of ways, only one of which was hearing loss. It is therefore inappropriate to compare students in the

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44 Recall that high scores on the Bristol indicate <u>lesser</u> adjustment.

TABLE 9

SELF CONCEPT AND SOCIAL ADJUSTMENT SCORES
BY SEVERITY OF LOSS

Group	Self Concept[a]	Social Adjustment[a]
Elementary		
Normal (0-25 db) (n=21)	36.5	11.6
Mild (26-40 db) (n=32)	37.0	10.9
Marginal (41-55 db) (n=28)	38.7	9.9
Moderate (56-70 db) (n=29)	35.3	8.4
Severe (71-90 db) (n=19)	36.6	8.2
Profound (90+ db) (n=6)	32.3	6.8
OVERALL (n=135)	36.7	9.7
Secondary		
Normal (n=2)	25.3	8.0
Mild (n=11)	19.8	4.1
Marginal (n=9)	26.1	5.3
Moderate (n=7)	21.7	2.9
Severe (n=8)	17.3	3.4
OVERALL (n=37)	21.4	4.2

a See notes for Table 8.

various programmes without first taking all of these differences into account. We have seen how very complex this task becomes when we merely try to juggle a few factors in our minds. Fortunately, there is a satistical technique which helps. It is called "stepwise multiple regression."

If researchers could have their way, children would be randomly assigned to programmes, and then students in the various programmes would be, on average, the same. Stepwise multiple regression is a substitute for randomization. It is not perfect, but it is better than nothing.

What this technique does is to allow a researcher to account for the effect of variables in any order desired. Thus, for example, we can look at the effect of hearing loss on, say, reading achievement. Then once that is out of the way, we can look to see whether or not aural and oral functioning have an additional effect over and above that due to hearing loss, and then home environment, and so on down the line. Once a variable has been looked at, it no longer affects the results. At the very end, we can look at the effect of the programme in which a student is enrolled, and compare one programme with another.

For elementary children, the variables we have to take into account are (1) age, (2), pure tone average, (3) high frequency average, (4) language background, (5) aural and (6) oral functioning, (7) use of a hearing aid at home, (8) mother's education, (9) degree of parental help at home, (10) parental contact with the school, (11) number of years in preschool.[45]

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45 These variables were entered at the following inclusion levels from first to last entered: (1) age; (2) all variables relating to hearing loss (2 through 7); (3) variables relating to background experiences (8 through 11). At the last inclusion level, programme was entered. We again assessed the effects of programme by running two regression equations, one comparing segregated with integrated students, and one comparing students receiving itinerant support with those who were fully integrated. Hearing aid use at school was not included because it was related to school programme independently of PTA - children in hard of hearing classes were most likely to wear aids, even taking into account their greater degree of impairment. This higher degree of hearing aid use may be appropriately considered part of the programme. To enter it as a control variable might therefore mask the effect of programme.

At the secondary level, we only need to control for variables 1, 2, and 7. However, we need to substitute father's for mother's level of education (8). Number of years in preschool was not included because only fully integrated children have had preschool experience. Therefore, entering this variable would artificially depress the effect of programme.

The Effects of Various Programmes

We will not discuss the effect of the various background factors at this time. Some of them are known to be related to achievement in normal children, parents' level of education, for example. Background variables will be discussed in conjunction with the next chapter - criteria of success. Here we will only discuss those that are specifically relevant to the question of which type of programme is better for hard of hearing children.

In general, the evidence provides some support for the superiority of integrated over segregated programmes. At the elementary level, students in hard of hearing classes had lower scores in reading and language[46] than students in the other two groups. There were no differences in self concept, social adjustment, or speech intelligibility. Fully integrated students were marginally better in reading than those receiving itinerant help, and they were also better adjusted.[47] There were no differences in language, self concept, or speech intelligibility.

At the secondary level, there were no differences between students who were partially integrated and the other two groups. However, fully integrated students were marginally better than the itinerant group in language. The itinerant group, on the other hand, had

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46 Reading (elementary) - Integrated vs. Segregated:
$F = 11.603$; $df = 12/116$; $p \leq .05$; $r^2 = .04$.

Language (elementary) - Integrated vs. Segregated:
$F = 16.766$; $df = 12/116$; $p \leq .05$; $r^2 = .06$.

47 Reading (elementary) - Itinerant vs. Fully Integrated:
$F = 1.645$; $df = 12/84$; $p \leq .10$; $r^2 = .01$.

Bristol Social Adjustment Guides (elementary) - Itinerant vs. Fully Integrated:
$F = 3.271$; $df = 11/85$; $p \leq .05$; $r^2 = 03$.

a higher self concept.[48] There were no differences between the itinerant and fully integrated groups on reading, social adjustment, or speech intelligibility.

Taken together, these findings might be viewed as generally supportive of the value of integration. Of the six significant comparisons, five favour the more integrated group. Thus children in hard of hearing classes were doing more poorly than itinerant and fully integrated students, and students receiving itinerant help were doing more poorly than those who were fully integrated. There is only one finding which contradicts this general pattern, and that is the discovery that secondary level itinerant students had higher self concepts than their peers who were fully integrated.

However, this general pattern did not hold true for the other fourteen comparisons. This means that most of the differences between programme groups that were noted before were all due to prior differences in age, hearing loss and functioning, and background experiences.

It is also possible that the significant findings which did emerge merely reflect sample bias. It may only be the child with good language development, good academic potential, and good adjustment who manages to survive in a regular class without being referred for either itinerant help or segregated placement. These results may merely indicate that the placements made in the past have been correct. We have previously discussed the background factors on which children in the various programmes differed. We have presented stepwise multiple regression as a way of controlling for these differences. But this type of statistical control is not perfect. It is, therefore, entirely possible that integrated students were doing better simply because they had a lesser handicap, more parental and social support, greater emotional stability or some other resource which enabled them to survive that we didn't even attempt to measure.

However, there is another way to attack this problem. If integration is a good thing, students should improve academically and socially the longer they are in integrated programmes. On the other hand,

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48 Language (secondary) - Itinerant vs. Fully Integrated:
$F = 2.252$; $df = 5/20$; $p \leq .10$, $r^2 = .08$.

Self Concept (secondary) - Itinerant vs. Fully Integrated:
$F = 9.806$; $df = 5/131$; $p \leq .05$; $r^2 = .18$.

if their superiority is merely the cause rather than the result of their integration, children who have just been integrated should be performing as well as those who have been in regular classes for a longer period of time.

In order to test this hypothesis, a regression analysis was done separately for each of the programme groups. These analyses controlled for the same set of background variables that were included when programmes were compared. This time, however, the last variable entered was the proportion of time students had been in that programme. There were scattered effects which indicated that children improved their relative position the longer that they were integrated.

Recall that integrated children at the elementary level surpassed those in hard of hearing classes in reading and language development. The present analysis showed that children in hard of hearing classes fell further behind in reading the longer they remained in those classes.[49] Hard of hearing children typically develop at a slower rate. However, the point of this finding is that similar children in integrated programmes developed at a more normal rate.

In language, however, and in speech intelligibility, children in the itinerant programme progressed in ability the longer they were in that programme.[50,51] All of these results refer to performance relative to what would be expected for a particular age level, taking into account the fact that all children generally increase in their absolute level of ability with age. Thus, children in the hard of hearing classes fell further and further behind their agemates, and children receiving itinerant help began to close the gap between their level of performance and the level that would be expected for a normal child.

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49 Reading scores (elementary hard of hearing classes) - Regression on proportion of time in class: $F = 2.605$; $df = 12/19$; $p \leq .05$; $r^2 = .03$.

50 Language (elementary itinerant children) - Regression on proportion of time receiving itinerant help: $F = 2.643$; $df = 12/23$; $p \leq .05$; $r^2 = .03$.

51 Speech intelligibility (elementary itinerant children) - Regression on proportion of time in itinerant programme: $F = 3.023$; $df = 12/23$; $p \leq .05$; r^2 .3.

At the secondary level, the students receiving itinerant help also increased in speech intelligibility with time.[52] There were two negative findings, however. Itinerant students at the secondary level became somewhat less socially adjusted the longer that they had been receiving itinerant help.[53] Fully integrated students declined in self concept with time (see Figure 2 for a summary of all the regression analyses).[54]

Summary

In general, students who were fully integrated had higher scores in reading, language, and speech intelligibility than students who were integrated with itinerant help, and these students in turn had higher scores than the hard of hearing class (elementary) or partially integrated groups (secondary). Scores also generally decreased with increases in the severity of the hearing loss. Since students in the more integrated settings generally had less degrees of loss, their higher levels of achievement may be partly due to this rather than to programme per se.

When hearing loss as well as the other differences in background were taken into account, there was little remaining difference between groups to unequivocally attest to the superiority of one programme over another. At the elementary level, students in hard of hearing classes scored lower in reading than students in the other two groups, and they continued to decline in reading the longer they remained in hard of hearing classes. Students in hard of hearing classes were

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52 Speech intelligibility (secondary itinerant students) - Regression on proportion of time in itinerant programme: $F = 5.884$; $df = 4/9$; $p \leq .05$; $r^2 = .05$.

53 Bristol Social Adjustment Guides (secondary itinerant students) - Regression on proportion of time in programme: $F = 2.84$; $df = 5/8$; $p \leq .10$; $r^2 = .13$.

54 Self concept (secondary regular students) - Proportion of time in programme: $F = 101185$; $df = 4/5$; $p \leq .05$; $r^2 = .45$. Because of the small size of the groups at the secondary level, the results from these regressions on time in programme are at best suggestive.

FIGURE 2

SUMMARY OF REGRESSION ANALYSES

Comparison	Measure				
	Reading	Language	Speech Intelligibility	Self Concept	Self Adjustment
Part A Programme Comparisons					
Elementary					
Integrated versus[a] hard of hearing group	Integrated*	Integrated	---	---	---
Fully integrated versus itinerant-help group	Fully Integrated	---	---	---	Fully Integrated
Secondary					
Integrated versus[a] partially integrated group	---	---	---	---	---
Fully integrated versus itinerant-help group	---	Fully Integrated	---	Itinerant	---
Part B Changes Over Time					
Elementary					
Fully Integrated	---	---	---	---	---
Itinerant-Help	---	Increase	Increase	---	---
Hard of Hearing Class	Decrease	---	---	---	---
Secondary					
Fully Integrated	---	---	---	Decrease	---
Itinerant-Help	---	---	Increase	---	Decrease
Partially Integrated	---	---	---	---	---

* Indicates the superior group in the comparison.

a The integrated group is comprised of the fully integrated and itinerant-help students taken together.

also further behind in language. Itinerant-help students, on the other hand, continued to progress in language the longer that they were integrated. They also progressed in speech intelligibility. At the secondary level fully integrated students surpassed those receiving itinerant help in language. However, itinerant-help students, like those at the elementary level, increased in speech intelligibility with passage of time.

The results attesting to the superiority of the more integrated groups can be interpreted as supporting the value of integration, or may be viewed as reflecting sample bias. However, it is important to note that the results do not support the view that integration is harmful to academic achievement. It seems then that the wisest attitude to adopt is one of cautious optimism with regard to the value of integration.

The effects of integration on personal development present a somewhat different picture. The one favourable finding is that fully integrated students at the elementary level had better adjustment than those receiving itinerant help. This could also reflect sample bias. However, the other findings are more negative. At the secondary level it was discovered that the social adjustment of itinerant-help students declined the longer that they were integrated. It was also found that the self concept of fully integrated students similarly declined.

Again we can at best draw a tentative conclusion from this pattern of results. There is not overwhelming evidence that integration is harmful to self concept and social adjustment, but there is sufficient evidence to signal the need for caution.

Up to the present time, children have not been integrated on a wholesale basis. In most cases, placement has resulted from the decision of the school or the home that this was the best setting for the child. The results of this study, in general, support the wisdom of these decisions that have been made. They should, we believe, encourage educators to proceed even further in the direction of integration, as long as they proceed in a cautious and careful manner. In the next chapter we will discuss guidelines that should be used in selecting children for integration.

VII -- WHAT ARE THE CRITERIA FOR SUCCESS?

In the previous chapter, we have presented some evidence to show that integration is preferable to segregation, and, in particular, that the itinerant programme is a help to the hearing-impaired child. However, we cannot conclude from this evidence that all segregated classes should be disbanded. All we can really conclude is that integration seems to have worked well for the children who have been integrated up to the present time. However, children have not been integrated on a wholesale basis. In fact, very few children have been integrated out of a segregated setting. In most cases, children who were integrated had always been integrated. Even those who were receiving itinerant support had not been referred for special help until several years had passed, during which time they had more or less survived on their own. Segregated children, however, were referred for special placement very early. Thus their handicaps were probably more severe and obvious to begin with.

We have seen that the various groups of children differed on a variety of background measures. We have tried, through statistical means to take these differences into account. However, this type of control is not perfect, and caution must be exercised in generalizing these results to other groups of children.

In this chapter, we will discuss the criteria that should be used in selecting children for integration. The analysis proceeds on the assumption that integration is only, in fact, a reality when children are functioning within the level of their peers in the class. As a measure of this, we have teacher ratings of how well the child functioned, in a general sense, within the class. Teachers rated students as functioning "well above class average," "somewhat above the class average," "at the class average," "somewhat below the class average," or "well below the class average." Very few children were functioning at the lowest level - i.e. "well below the class average." Only 11% and 12% respectively of the fully integrated and itinerant children at the elementary level were rated as being at this level. This itself is evidence of the success of integration.

However, an additional 33% of the fully integrated and 21% of the itinerant children were functioning somewhat below grade level. We have decided to use this as our cut-off point for success. This may be too conservative a strategy but, since we have reason to believe that hard of hearing children tend to be placed in lower achieving classes, (p.70), we feel this strategy is a reasonable one.

In view of the low association between teacher ratings and objective measures, a second criterion of success was introduced. It is the discrepancy in reading level. If a student was rated by the teacher as performing at or above the class average, and if his or her reading performance was not more than two years below age level, the student was considered to be successfully integrated. If, however, either of these two conditions was not met, the student was considered not to be successfully integrated. A total of 48% regular and 39% itinerant students were not successfully integrated by this criterion.

Elementary Level

1. Hearing Loss

We have seen that children who were integrated had more hearing than those who were not. It is this which partly accounts for their greater level of achievement. Fully integrated children had an average PTA of 42 db and an average HFA of 52 db. However, the spread was quite wide. The standard deviation for PTA was 21; this means that the group was really spread out over a range of from 21 db (42 minus 21) to 63 db (42 plus 21). Two-thirds of the group fell within this range, and the rest were still higher or lower.

The standard deviation for HFA was 25, indicating that the large body of the group was really spread out at the higher frequencies over a range of from 27 db to 77db. Thus, provided that other factors are favourable, children can be integrated without special support who have losses well into the moderate range.

The average aural functioning score for fully integrated children was 18.2 correct out of 22, with a standard deviation of 4.6. The average oral functioning score was 19.6 with a standard deviation of 2.5. Thus the floor for aural functioning was 62% correct, and for oral functioning, 78%.

Successful and unsuccessful children within the group of fully integrated students did not differ on any of these measures of hearing loss.

Children receiving itinerant support had an average PTA of 54 and an HFA of 69. Both measures had standard deviations of 25. Thus children integrated with itinerant support ranged into the severe category (PTA up to 70; HFA up to 94). The average aural functioning score of this group was 17.0, and oral functioning averaged 19.2. With standard deviations of 5.8 and 2.7, respectively, the floor for performance on these tests was 51% for aural and 75% for oral functioning. It is interesting to observe that children integrated with itinerant help had greater losses than those who were fully integrated, with correspondingly low aural functioning scores. However, oral functioning was proportionately elevated, and itinerant students performed at a similar level on this measure to the fully integrated students who had lesser degrees of loss to begin with.

In contrast to the fully integrated group, measures of hearing loss further differentiated children within the itinerant group who were succeeding from those who were not. But the effect was not as expected, since it was the children with <u>greater</u> losses who were <u>more</u> likely to be successful. Children who were succeeding had an average PTA of 61 db versus the average of 43 db for those who were not succeeding.[55] Likewise, successful children had a greater degree of functional loss. They averaged only 73% correct answers on the aural functioning scalw versus 86% for those who were not successful,[56] and 86% versus 91% on oral functioning.[57] Successful children also had <u>less</u> intelligible speech (3.6 vs. 5.0).[58]

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55 PTA (elementary - itinerant) - Successful vs. unsuccessful: $F = 5.126$; $df = 1/36$; $p \leq .05$; $r^2 = .12$.

56 Aural Functioning (elementary - itinerant) - Successful vs.unsuccessful: $F = 4.179$; $df = 1/39$; $p \leq .05$; $r^2 = .10$.

57 Oral functioning (elementary - itinerant) - Successful vs. unsuccessful: $F = 3.978$; $df = 1/39$; $p \leq .05$; $r^2 = .09$.

58 Speech intelligibility (elementary - itinerant) - Successful vs. unsuccessful: $F = 9.424$; $df = 1/37$; $p \leq .05$; $r^2 = .20$.

Children with greater losses also were more socially adjusted in line with their higher levels of achievement.[59] In the previous chapter (p. 73), it was shown that higher degrees of loss were associated with higher levels of adjustment, and, therefore, that there was a tendency for integrated children, who generally have lesser degrees of loss, to be less socially adjusted. However, since all of the children in the itinerant group were integrated, it cannot be integration alone which was responsible for the adjustment problems that these children with lesser degrees of loss experienced.

There are two possible explanations. One is that children who are integrated with only mild handicaps constitute an invisible group. Children with a 60 db loss have an impairment which is obvious to others. Aural and oral functioning are lower, as is speech intelligibility; the child's problems are clear. But when the loss averages only 40 db, the handicap goes underground. Even though the teacher may be consciously aware that the child has a handicap, she is not continually reminded of this fact, and may make less accommodation to the problem. Social difficulties may result when the handicap is not obvious to the child's peers, and they do not make allowances for his or her difficulties.[60]

Fisher (1971) discusses the problems of detecting low levels of impairment. The essential difficulty is that children with mild or marginal losses have enough residual hearing to enable them to comprehend normal speech under good conditions. However, when acoustics are poor or when the child is tired or bored, listening is more difficult. But since the child has been observed to hear on other occasions, the teacher infers that he or she is slow, is poorly motivated, or has a behaviour problem, rather than that there is a hearing loss.

Now our major criterion of success was the teacher's rating, and the Bristol social adjustment guide is also a teacher report instrument. It is possible that children who were integrated with more noticeable handicaps were not, in fact, more successful, but were only

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59 Social adjustment (elementary - itinerant) - Successful vs. unsuccessful: $F = 18.575$; $df = 1/39$; $p \leq .05$; $r^2 = .32$.

60 This explanation was first suggested to the authors by Dr. Robert MacIntyre of the Department of Special Education, OISE.

rated more highly by the teacher because she was taking the handicap into account. However, evidence exists that this was not the case. In the first place, a child also had to have a reasonably high reading score in order to qualify as successful; a good teacher rating was not sufficient. Furthermore, successful children also had higher scores on the standardized language test.[61] It thus must be the case that the educational environment is in some way different for children with mild as opposed to more severe handicaps.

We could find no clue in our data as to what the differences might be. We thought that teachers might have made more adjustments for the successful group; however, this was not the case. We also thought that teachers might have made more adjustments for the less intelligible child. There was, in fact, a weak correlation between number of teacher modifications and speech intelligibility, but it was only marginally significant ($r = -.18$; $p \leq .13$). Finally, we looked to see if perhaps the itinerant teachers had spent more time with successful children. However, the reverse was true. Most (65%) of the successful children only had contact with the itinerant teacher on a follow-up basis.

So the mechanism of the greater success of the more severely impaired child remains a mystery. And this lends credence to a second possible explanation. It is possible that these results are spurious, and due wholly to sample bias. It may be that children with greater losses only remain integrated if they succeed. When they fail, they are placed in a segregated setting. With mildly impaired children, on the other hand, there is a reluctance to segregate them even when they are not doing well.

The only way to decide between these two explanations would be to look more closely at what happens to hearing impaired children in a regular classroom. The data we gathered on what a teacher does was very limited. It may be that actual observations of what goes on would tell a different story, and show that the teacher is more accommodating to the more severely impaired child.

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61 Language (elementary - itinerant) - Successful vs. unsuccessful: $F = 6.932$; $df = 1/39$; $p \leq .05$; $r^2 = .15$.

If, however, the data is taken at face value, the implication is that children with milder problems must be integrated with special care. The itinerant teacher must take extra steps to insure that regular teachers are aware of and truly responsive to their problems. In the presence of a mild hearing loss, the teacher may not be in a good position to evaluate how well the child is doing. Performance below par may be attributed to low intelligence or poor motivation, rather than to the real cause.[62]

2. Home Environment

Parents of successful and unsuccessful children also differed on a number of home environment variables. For fully integrated children, parents' own education and their aspirations for the child's education were important. The parents of unsuccessful children had usually not graduated from high school, while the parents of successful children more often had.[63,64] Parents of unsuccessful children generally wanted their child to graduate from high school, while parents of successful children expected them to attend college.[65]

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62 Part of the success of the more severely impaired students is due to a small group of children who were in a special itinerant programme in Milton. This group of eleven children were originally from the school for the deaf, and were integrated into a regular junior and senior public school with two trained teachers of the deaf present full time in the receiving schools (see p. 16). These teachers functioned in a manner similar to the itinerant teachers, and so these children were included with the itinerant group. A very important difference, however, was that their contact with the itinerant teachers was a much more intense one, and the "itinerant" teachers had a permanent relationship with the school. The children in this group had greater losses, and their success is discussed later on in this chapter. However, removing them from the rest of the itinerant group does not substantially change the results of the analysis reported here. Within the reduced itinerant group, the positive relationship between PTA and success does not reach conventional levels of significance. However, the relationships between aural and oral functioning and success do remain, with lower levels associated with higher success. The more severely impaired children also had higher social adjustment and less intelligible speech.

63 Mother's education (elementary - fully integrated) - Successful vs. unsuccessful: $F = 5.257$; $df = 1/71$; $p \leq .05$; $r^2 = .07$.

64 Father's education (elementary - fully integrated) - Successful vs. unsuccessful: $F = 3.836$; $df = 1/71$; $p \leq .05$; $r^2 = .05$.

65 Parents' aspirations (elementary - fully integrated) - Successful vs. unsuccessful: $F = 15.481$; $df = 1/61$, $p \leq .05$; $r^2 = .20$.

As a group, mothers of children receiving itinerant support had at least attended high school, and fathers had generally graduated. Therefore, this measure did not further differentiate successful from unsuccessful children since the group as a whole had attained the educational level that seems to be required. However, not all parents expected their child to attend college, and those who did were more often the parents of successful children than those who had lower expectations for their child's education.[66]

It is difficult, however, to say whether or not parental aspirations should be a criterion for integration, since they may easily be the result of the child's success rather than its cause. However, it is reasonable to use the parents' own educational level as a criterion for integration, and it seems that children will have more difficulty when their parents have not at least attended high school, if not graduated.

As a group, children who were integrated, whether with or without itinerant help, had parents who gave them some help at home. Sixty-six per cent (66%) of those who were fully integrated and 55% of those who were integrated with itinerant support had such help. This was less often true of children in hard of hearing classes (47%). Furthermore, the two integrated groups more often received an exceptional degree of help from their parents - 17% and 12%, respectively - while few children in hard of hearing classes were helped to this degree(6%). Thus, parental willingness to provide extra help at home seems to be a criterion that should be used in deciding whether or not a child is likely candidate for integration.

Children integrated with itinerant help had parents who were willing to involve themselves in the school in what might be called a normal manner, that is at the level we might expect "good" parents to be involved. They talked with the teacher by phone or attended scheduled programmes put on by the school (60%). This was also true for children integrated without special help (65%). However, these children more often had parents who became involved in exceptional

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66 Parents' aspirations (elementary - itinerant) - Successful vs. unsuccessful: $F = 5.420$; $df = 1/35$; $p \leq .05$; $r^2 = .13$.

ways, visiting the school on a periodic or continuing basis (26% vs. 10%).[67] Thus, parental involvement also seems to be a prerequisite for integration, particularly if the child is to receive no specialized support.

3. IQ

The average IQ for the sample as a whole was 103 with a standard deviation of 15. This means that two-thirds of the group had IQ's falling between 88 and 118; only 16% or 17% fell below this level. All of the results of this study, therefore, pertain to children with normal intelligence. For a child whose intelligence is lower than this, placement in a hard of hearing class may not even be indicated.

The IQ's of children who were integrated with itinerant help also fell within this range (mean of 101 with a standard deviation of 17). There was no difference in IQ between successful and unsuccessful children in this group. However, among children who were fully integrated, successful children had IQ's that dropped no further than the low 90's (mean of 106 with a standard deviation of 15). Unsuccessful children had IQ's which extended down into the mid 80's (mean of 100 with a standard deviation of 14).[68]

4. Age at Which Hearing Aid Received

Both fully integrated and itinerant children had been diagnosed before age 7 (means of 4.7 and 4.5, respectively, with standard deviations of 2.4 and 2.5). Successful and unsuccessful children in these two groups did not differ further on age of diagnosis. Given their average degree of loss, diagnosis by this age was presumeably adequate.

However, for children whose loss is severe enough to require a hearing aid, early diagnosis and fitting with an aid is important. Children who were successful in the itinerant programme received their hearing aids over a year earlier than children who were unsuccessful.[69] For successful children, fitting with an aid almost always occurred

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67 Parents' involvement (elementary) - Itinerant vs. fully integrated: $F = 14.565$; $df = 1/112$; $p \leq .05$; $r^2 = .12$.

68 IQ (elementary - fully integrated) - Successful vs. unsuccessful: $F = 3.137$; $df = 1/70$; $p \leq .10$; $r^2 = .04$.

69 Age at which aid received (elementary - itinerant) - Successful vs. unsuccessful: $F = 4.159$; $df = 1/26$; $p \leq .05$; $r^2 = .14$.

by the middle of the fifth year (mean age of 4.1 with a standard deviation of 1.3). For unsuccessful children, however, diagnosis did not occur in some cases until the eighth year (mean of 5.6 and standard deviation of 2.6). Age of fitting with an aid, however, should probably not of itself be a criterion for placement. The data does suggest that early fitting is important, and late fitting should perhaps be used as a signal that the child's language functioning should be more carefully scrutinized.

Age of fitting with an aid did not differentiate successful from unsuccessful children who were fully integrated. Some children in this group who were eventually fitted with aids did not receive them until their eighth year (mean of 5.4 and standard deviation of 2.5). But hearing aids were probably less important for these children because of their milder losses.

5. Age

Successful children who were receiving itinerant help were somewhat younger than those who were not successful (10.7 vs. 12.6 years).[70] This may signal a tendency for children to have more difficulty in school as they grow older.

6. Language Background

Most (three-quarters) of the children in this study were from English-speaking homes. Children receiving itinerant support were more often from English-speaking homes than children in the other two groups. This may indicate that non-English speaking children have more difficulty and are more likely to require placement in hard of hearing class.

7. Teacher Knowledge

Successful children receiving itinerant support had teachers who scored slightly higher than unsuccessful children on the teacher knowledge test.[71] This was not true for children who were fully

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70 Age (elementary - itinerant) - Successful vs. unsuccessful: $F = 6.375$; $df = 1/39$; $p \leq .05$; $r^2 = .14$.

71 Teacher knowledge (elementary - itinerant) - Successful vs. unsuccessful: $F = 3.224$; $df = 1/38$; $p \leq .05$; $r^2 = .08$. This relationship was not significant when the Milton Group was excluded from the analysis.

integrated. Presumably this is because they had lesser degrees of loss and more involved parents.[72]

Secondary Level

At the secondary level, students rated by their teachers as performing "well below the class average" comprised the following proportions of the three groups: fully integrated, 8%; itinerant support, 6%; partially integrated, 0%. According to our criteria of success which combines teacher ratings with reading ability, 58% of the fully integrated, 44% of those integrated with itinerant support, and 64% of the partially integrated were successful in their placements.

1. Hearing Loss

Students who were partially integrated had an average loss as measured by PTA of 69 db, with a standard deviation of 16. Thus, these students had losses ranging up to 85, well within the severe category. The fully integrated and itinerant groups averaged 41 db and 48 db respectively, with standard deviations of 20 and 14. Thus, students in both of these groups had losses ranging up to 60 db, which is within the moderate category.

HFA averaged 78 db for partially integrated students with a standard deviation of 26. Thus, some students in this group had losses at the higher frequencies that were greater than 100 db. Fully integrated and itinerant groups had average HFA's of 61 db and 70 db respectively, with standard deviations of 30 and 33. Thus their losses ranged up to more than 90 db. PTA and HFA did not further differentiate successful from unsuccessful students within programmes.

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72 Other variables also discriminated successful from unsuccessful children. However, their effect can only be interpreted as the result rather than the cause of the child's success. For fully integrated children, successful children had fewer professional contacts, were exposed to fewer teacher modifications, had been in fewer different programmes, had less often been to preschool, and had parents who gave them less help at home. Itinerant children who were successful also had fewer professional contacts outside of the itinerant teacher.

The secondary group as a whole had similar aural but higher oral functioning scores than the two integrated groups at the elementary level. Aural functioning scores averaged 18.6 out of 22 correct with a standard deviation of 4.8. Thus, the floor for successful integration at the secondary level was a score of 63%. The average score for oral functioning was 20.6, with a standard deviation of 1.6, giving a floor of 86%.

2. Home Environment

Generally speaking, parents of all three groups of secondary students had an average educational level of Grade 12. There was a group of fully integrated students whose mothers generally had only attended high school, and these students were less likely to be successful.[73] Most parents (59%) had given some type of help at home to their child. Their level of involvement in the school was about what would normally be expected from "good" parents, and they expected their child to graduate from high school or attend college. There was a group of partially integrated students whose parents only expected them to graduate from high school, and they were less likely to be successful.[74] However, as was true at the elementary level, it is impossible to say which is cause and which is effect.

3. IQ

Secondary students as a whole again had IQ's within the normal range. Within the partially integrated group, however, unsuccessful students had IQ's ranging down to 83 (mean of 92.3 with a standard deviation of 9.7), while successful students did not go below 95 (mean of 108.7 and standard deviation of 13.9).[75] The same was true for the itinerant group. Unsuccessful students in that group ranged down to an 80 IQ (mean of 97.2 with a standard deviation of 16.8), while successful students did not go below 97 (mean of 113 with a standard deviation of 16.3).[76] However, IQ did not distinguish between

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73 Mother's education (secondary -fully integrated) - Successful vs. unsuccessful: $F = 3.281$; $df = 1/10$; $p \leq .10$; $r^2 = .25$.

74 Parents' aspirations (secondary - partially integrated) - Successful vs. unsuccessful: $F = 7.000$; $df = 1/7$; $p \leq .05$; $r^2 = .50$.

75 IQ (secondary - partially integrated) - Successful vs. unsuccessful $F = 4.312$; $df = 1/9$; $p \leq .10$; $r^2 = .32$.

76 IQ (secondary - itinerant) - Successful vs. unsuccessful: $F = 3.570$; $df = 1/14$; $p \leq .10$; $r^2 = .20$.

successful and unsuccessful children, who were fully integrated, among whom IQ dropped to 87 without apparent ill effect (mean of 102 with a standard deviation of 14.6).

4. Age at Which Aid Received

Students at the secondary level had been diagnosed and had received their hearing aids about a year after those at the elementary level. Diagnosis occurred before 9 years (mean of 5.4 and standard deviation of 3.3), and fitting with an aid, for those who had one, also occurred by this age (mean of 6.4 and standard deviation of 2.9). However, there was a group of regularly integrated children who had been diagnosed at a later age - up to 12 years (mean of 8 and standard deviation of 4.3). These children were less likely to be successful.[77] Successful children were diagnosed by age 7 (mean of 4.4 and standard deviation of 2.2). Unsuccessful children from this group were also less likely to have an aid or to use it at home, while more successful children did.[78]

5. Age

Age did not vary among groups or between successful and unsuccessful students within groups. However, the secondary sample as a whole averaged 16 years of age. They were, therefore, just beginning their secondary career, and it is possible that they might have more difficulty later on.

6. Language Background

Secondary students as a group came from English speaking homes. Among the partially integrated and itinerant groups, the few non-English speaking students did not seem to be having any greater difficulty than the others. However, among the fully integrated, non-English speaking students were at a disadvantage.[79]

7. Teacher Knowledge

Teacher knowledge was not a factor between or within groups.

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77 Age of diagnosis (secondary - fully integrated) - Successful vs. unsuccessful: $F = 3.587$; $df = 1/10$; $p \leq .10$; $r^2 = .26$.

78 Hearing aid use at home (secondary - fully integrated) - Successful vs. unsuccessful: $F = 5.556$; $df = 1/10$; $p \leq .05$; $r^2 = .36$.

79 Language Background (secondary - fully integrated): $F = 3.324$; $df = 1/10$; $p \leq .10$; $r^2 = .25$.

The Development of Criteria

On the basis of the evidence, it is possible to draw a profile of the child who is likely to be successful in the various types of programmes.

Elementary children who are likely to succeed in a fully integrated programme have the following characteristics (see Table 10):

(1) a loss at the lower frequencies (PTA) not exceeding the moderate range, and an average loss at the higher frequencies not going beyond severe;

(2) good aural and oral functioning (scores no less than 62% and 78%, respectively);

(3) parents who themselves have been to high school, who expect their child to graduate from high school or attend college, who give their child some help at home, and who may be somewhat more involved with the child's school than parents are usually expected to be;

(4) intelligence within the higher range of "normal";

(5) diagnosis by no later than seven years of age, and fitting with an aid, if required, by no later than age eight;

(6) English language background.

Elementary children who are likely to succeed in a programme of itinerant help have the following characteristics:

(1) a PTA no higher than the severe range, although losses at the higher frequencies can range into the profound category;

(2) good aural and oral functioning (scores no less than 51% and 75%, respectively;

(3) parents who themselves have been to high school, who expect their child to graduate from high school or attend college, who help their child at home, and who have a "good" level of involvement with the school;

(4) normal intelligence;

(5) diagnosis by no later than seven years of age, but fitting with an aid, if required, by no later than five and a half years of age;

(6) English language background;

(7) a well-informed teacher.

TABLE 10

CRITERIA FOR INTEGRATION INTO VARIOUS PROGRAMMES

Criteria[a]	Group: Elementary		Secondary		
	Fully Integrated	Itinerant Help	Fully Integrated	Itinerant Help	Partially Integrated
PTA no higher than:	moderate[b]	severe * [c]	moderate	moderate	severe
HFA no higher than:	severe	profound * [c]	profound	profound	profound
Aural functioning no less than:	62%	51% * [c]	63%	63%	63%
Oral functioning no less than:	78%	75% * [c]	86%	86%	86%
Parents' education no less than:	attended * high school	attended high school	attended * high school	attended high school	attended high school
Parents' aspirations no less than:	high school * graduation or college	high school * graduation or college	high school graduation or college	high school graduation or college	high school * graduation or college
Degree of help given at home:	some	some	some	some	some
Parents' involvement in school:	good to exceptional	good	good	good	good
IQ no less than:	90 *	85	87	97 *	95 *
Loss diagnosed no later than:	7 years	7 years	7 years *	9 years	9 years
Aid fitted no later than:	8 years	5 1/2 years *	9 years	9 years	9 years
Language background:	English	English	English *	English	English
Teacher knowledge:	-	well informed *	-	-	-

a A criterion which is implicit throughout this analysis is that a student is reading within two years of age-level.

b Criteria were determined in two ways. In some cases, a variable differentiated successful from unsuccessful children in a group. This is indicated by an asterisk (*). The criterion was based on the characteristics of the successful group. In cases where the variable did not differentiate between successful and unsuccessful children, the criterion was based on the characteristics of the group as a whole.

c In the case of the itinerant help group (elementary), successful and unsuccessful children differed on PTA, HFA, aural and oral functioning. However the criteria were based on the group as a whole since it was the more severely impaired children who were likely to be successful. This suggests that some other variable was intervening between their hearing loss and level of performance (see pp. 95-97).

Comparing the two groups, children who are successfully integrated without specialised support services have a lesser degree of loss, a higher level of intelligence, and more involved parents. But children with greater losses, less intelligence, and less involved parents can succeed if itinerant support is provided. However, it is necessary to give special consideration to children with a milder loss, since their handicap is likely to be invisible to the regular teacher.

At the secondary level, the following profile characterizes students who are successfully integrated without specialized support:

(1) a loss at the lower frequencies not exceeding the moderate range, although losses at the higher frequencies can range into the profound category;

(2) good aural and oral functioning (scores no less than 63% and 86% respectively);

(3) Parents who have at least attended high school, who expect the student to graduate from high school or attend college, who have given some help to the student at home, and who have a good level of involvement with the school;

(4) normal intelligence;

(5) diagnosis by no later than the seventh year, and fitting with an aid, if required, by age nine;

(6) English language background.

This student appears very similar to the fully integrated student at the elementary level. Hearing losses are in the moderate category, but aural and oral functioning are good. In both cases the home environment is good. At the elementary level, there is evidence that a higher level of intelligence is required, but this is not true at the secondary level where we might expect intelligence to be more crucial. At the secondary level, there is evidence that late diagnosis, i.e. after age seven, can signal difficulties, as can failure to use an aid at home. Both of these may be indicators of parental sophistication.

Students integrated at the secondary level with itinerant help had the following characteristics:

(1) a loss at the lower frequencies not exceeding moderate, although losses at the higher frequencies can range into the profound category;

(2) good aural and oral functioning (scores no less than 63% and 86%, respectively;

(3) parents who themselves have attended high school, who expect the student to graduate from high school or attend college, who give their child some type of help at home, and who have a good level of involvement with the school;

(4) intelligence somewhat above normal;

(5) diagnosis and fitting with an aid by the ninth year;

(6) English language background;

These students differ from the itinerant group at the elementary level in having a lesser degree of loss, and aural and oral functioning scores that are higher. Thus, it is tempting to conclude that students with severe losses may be able to succeed in a regular programme at the elementary level, but will have difficulty in a 4 or 5 year programme at the secondary level.

It is interesting to observe that the profile of fully integrated and itinerant students at the secondary level is similar with respect to hearing loss and functioning, as well as home environment. One difference between the two groups is that fully integrated students who were successful were diagnosed at an earlier age than students in the itinerant group. A second difference is that itinerant students had somewhat higher levels of intelligence. It is possible that this was required in order to compensate for the relatively late diagnosis.

Partially integrated students appear as follows:

(1) hearing losses not exceeding severe, although losses at the higher frequencies can range into the profound category;

(2) good aural and oral functioning (scores not less than 63% and 86%, respectively);

(3) parents who have attended high school, who expect their child to graduate from high school or attend college, who give the student some help at home, and whose involvement with the school is good;

(4) intelligence somewhat above normal;

(5) diagnosis and fitting with an aid by no later than the ninth year;

(6) English language background.

Integration of the Mildly Impaired

The sample contained 49 elementary and 10 secondary students who had PTA's below 40 db. In view of research quoted previously (p. 2), which shows that even very mildly impaired children may suffer educational retardation, it is interesting to look at the progress of this group of students.

At the elementary level, the average reading discrepancy score was .48, which means that the group as a whole was performing slightly higher than what might be expected. Most (32) of these children were fully integrated, and their average discrepancy score was .97, or almost a full year ahead. Fourteen students, however, were receiving itinerant help, and their average discrepancy score in reading was -.19. There were three students in hard of hearing classes, and their average discrepancy score was -1.6.

The pattern for language discrepancy scores is similar - an overall average for the group of .08, an average for the fully integrated of -.22, and an average of -2.4 for the three students in hard of hearing classes.

The conclusion to be drawn from these results is that even children with very mild impairments may have academic difficulties. That their difficulties are due to a hearing problem rather than to other personal or social factors is indicated by the fact that their speech was somewhat impaired. Speech intelligibility scores for the three groups fell from 5.3 to 4.9 to 4.6.

A similar, but more dramatic pattern emerged at the secondary level. There were ten mildly impaired students who were fully integrated, with an average discrepancy score in reading of -.9, and in language of .7. There were four such students integrated with itinerant help, and their average scores were -1.4 and -2.5, respectively. The speech of the two secondary groups, however, was essentially normal.

Integration of the Severely and Profoundly Deaf

Although most of the students in this study would be described as hard of hearing rather than deaf, 19% or 34 had losses over 70 db,

i.e. in the severe and profound category. Most of these children at the elementary level were in hard of hearing classes (10) or only partially integrated (6). At the secondary level there was only one student with this degree of loss who was fully integrated, and one who was partially integrated. At the elementary level, however, there were nine such students who were integrated with itinerant help, and seven who were integrated without any such help. Most of those integrated with itinerant help were in the special Milton programme. As described on p. 20, these six children, plus five others with lesser losses, were integrated in two Halton County schools with a full-time teacher from the Provincial school for the deaf in attendance. We had originally grouped these children with those receiving itinerant help. That is the category which they fit best, and the group was too small to form the basis for a full scale analysis.

However, because the group was composed mainly of children with greater degrees of loss, it is useful to take a separate look. In addition, the programme in which these children were enrolled was radically different from the other "itinerant" programmes in that their resource teacher was much more available, either to tutor individual children or to consult with their regular teachers.

The Milton Group

Although a comprehensive analysis cannot be done on a group this size, some observations can be made. To begin with, this group had a considerably greater loss than the other students receiving itinerant help. Milton students had an average PTA of 75 db vs. 49 db for the rest of the itinerant group.[80] With a standard deviation of 17, the Milton group had losses ranging up to 93 db, or into the profound category. Milton students averaged 87 db for HFA vs 60 db for the rest of the itinerant students.[81] Yet only one child out of the 11 was not succeeding by our criteria.

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80 PTA (elementary) - Milton vs. Itinerant:
$F = 14.839$; $df = 1/37$; $p \leq .05$; $r^2 = .29$.

81 HFA (elementary) - Milton vs. Itinerant:
$F = 10.749$; $df = 1/36$; $p \leq .05$; $r^2 = .23$.

The aural functioning of the Milton group was low -- corresponding to their greater degree of loss -- an average of 55% vs. 82%.[82] However, there was no difference in oral ability; both groups averaged about 87%. Thus, students in the Milton group were unusually good lipreaders. In fact, on average, 33% of their total oral functioning score was derived from lipreading, in contrast to 5% for the rest of the itinerant group.

We might expect the continual presence of a special teacher to raise the level of knowledge of the regular staff. This indeed is the case. Regular teachers of the Milton group had an average score of 81% on the Teacher Knowledge Test vs. 69% for teachers of the remaining itinerant students.[83]

In view of their greater degree of loss, it is significant that the Milton group did not differ from the others receiving itinerant support on any measure of educational success. Speech intelligibility was decreased.[84] However, there were no differences in reading or language discrepancy scores, self esteem or social adjustment, or teacher ratings of classroom performance. There were also no differences between the two groups on IQ. Therefore, the success of the Milton group must be attributed to their high level of oral functioning and the constant availability of the special teacher. There was a non-significant tendency for students in the Milton group to have been diagnosed earlier (3.6 years vs. 4.8 years)[85] and to have received an aid earlier (4.2 vs. 5.0 years).[86] This may also have contributed to their success, although it may merely reflect the fact that they have a greater degree of loss and were thus recognized earlier.

The Fully Integrated Group

All of the children in this group had a PTA greater than 71 db. They were thus considerably deafer than the other children who were

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82 Aural functioning (elementary) - Milton vs. Itinerant: $F = 14.563$; $df = 1/46$; $p \leq .05$; $r^2 = .27$.

83 Teacher Knowledge scores (elementary) - Milton vs. Itinerant: $F = 16.691$; $df = 1/39$; $p \leq .05$; $r^2 = .30$.

84 Speech Intelligibility (elementary) - Milton vs. Itinerant: $F = 14.322$; $df = 1/38$; $p \leq .05$; $r^2 = .27$.

85 Age of diagnosis (elementary) - Milton vs. Itinerant: $F = 2.001$; $df = 1/39$; $p \leq .15$; $r^2 = .05$.

86 Age at which aid received (elementary) - Milton vs. Itinerant: $F = 1.185$; $df = 1/27$; $p \leq .25$; $r^2 = .04$.

fully integrated.[87,88] All of the seven were successfully integrated by our criteria. Their aural functioning was correspondingly low and similar to the Milton group -- an average of 64% correct vs. 87% for the other fully integrated students.[89] However, once again, oral functioning was high and did not differ from the fully integrated children who had lesser degrees of loss -- both groups scored an average of 91%. Thus, this group too, like the Milton group, gained a great deal from lipreading -- in this case about 30%.

Since this group was not receiving any special help from the school, one might suppose that their IQ's might be higher. You will recall that IQ did differentiate successful from unsuccessful children in the fully integrated group. However, this was not the case. In fact, the average IQ of this group was only 94, as opposed to 104 for the rest of the group. Although this was not a statistically significant decline, it is clear that this group of deaf integrated children is not unusually intelligent.

There were two groups of factors which did differentiate the deaf children from the others. One is greater sophistication and educational involvement of their parents, and the other is earlier diagnosis and fitting with a hearing aid.

Mothers of the deaf group had, on average, some college education, while mothers of the children with milder losses had not even graduated from high school.[90] Most parents of the deaf group gave a high degree of help to their children at home, while parents of the others gave a more normal degree of help.[91]

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87 PTA (elementary - fully integrated) - Deaf vs. hard of hearing: $F = 65.253$; $df = 1/61$; $p \leq .05$; $r^2 = .15$.

88 HFA (elementary - fully integrated) - Deaf vs. hard of hearing: $F = 10.371$; $df = 1/60$; $p \leq .05$; $r^2 = .15$.

89 Aural functioning (elementary - fully integrated) - Deaf vs. hard of hearing: $F = 9.954$; $df = 1/61$; $p \leq .05$; $r^2 = .14$.

90 Mother's education (elementary - fully integrated) - Deaf vs. hard of hearing: $f = 3.291$; $df = 1/59$; $p \leq .05$; $r^2 = .06$.

91 Degree of help (elementary - fully integrated) - Deaf vs. hard of hearing: $F = 3.806$; $df = 1/60$; $p \leq .05$; $r^2 = .06$.

Age of diagnosis for the deaf children averaged two years earlier than for the other group (2.7 vs. 4.7 years)[92] as did fitting with a hearing aid (3.2 vs. 5.7 years).[93] Much of this may be due to the greater severity of their loss, but early recognition and treatment probably played a crucial role in their success nevertheless. Unfortunately, we did not collect information on the age at which special training was begun. However, we do know that this group had more special help in addition to that provided by the school than the other groups. These children, on average, had had contact with two different professionals over the course of their lives, while only one in three of the rest of the group had any such help at all. In contrast to this group, it is interesting to note that the severely impaired children in the Milton programme did not differ from the rest of the itinerant group either with respect to parent education and educational support, although there was a non-significant tendency for them to have been diagnosed and fitted with an aid at an earlier age.

Like the Milton children, the deaf children who were fully integrated did not differ from the other fully integrated children on any measure of performance except speech intelligibility which was significantly lower.[94] There were differences in reading, language, and on teacher ratings of classroom performance, but they were not statistically significant. Differences might have been significant if the group of deaf children had been larger. However, their scores on these tests averaged only slightly below the norm - about half a year in reading and language. This level of performance is still remarkable since deaf children typically have reading scores that are severely depressed. Bonnillian, Charrow, and Nelson (1973) review U.S. studies which indicate that deaf students attain only about the Grade 5 level in reading. Reich and Reich (1974) found that the reading scores of deaf adults in Ontario were all below the Grade 7 level. There were also no differences between the deaf and hard of hearing group on self

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92 Age of Diagnosis (elementary - fully integrated) - Deaf vs. hard of hearing: $F = 5.357$; $df = 1/56$; $p \leq .05$; $r^2 = .09$.

93 Age at which aid received (elementary - fully integrated) - Deaf vs. hard of hearing: $F = 7.044$; $df = 1/29$; $p \leq .05$; $r^2 = .20$.

94 Speech Intelligibility (elementary - fully integrated) - Deaf vs. hard of hearing: $F = 8.786$; $df = 1/56$; $p \leq .05$; $r^2 = .14$.

esteem or social adjustment. Thus, the integration of these children was truly a success. Although the results for these two groups of deaf children are truly encouraging, one must be cautious in generalizing about deaf children as a group because of the extremely small size of the sample.

A Reconsideration of Criteria

In general, the criteria outlined in Table 10 should be used as a guide in selecting students for integration. However, a number of additional comments can be made about the results of this study.

1. Hearing Loss and Functioning

First of all, although the various groups varied greatly in hearing loss, aural and oral functioning scores were remarkably similar. Children who had milder losses gained a great deal from hearing alone. But students who were integrated with greater losses seemed able to compensate for poor aural skills with an unusual facility in lipreading, thus bringing their oral scores up to the level of the other groups. In general, an oral functioning score of no less than 75% seems to be required at the elementary and 85% in a 4 - 5 year programme at the secondary.

A question which then arises is why all students could not be fully integrated since they all had high levels of oral skill: The answer lies in a limitation of our aural and oral functioning tests. These tests, it will be recalled, were administered on a one-to-one basis in a quiet room rather than in the noisier classroom environment. It is likely that the itinerant and partially integrated students, with their greater losses as measured by pure tone audiograms, would have more difficulty in a group setting than students in the fully integrated groups with their lesser measured losses. We thus recommend that both the results of pure tone audiograms and some indication of functioning in a more natural language situation be taken into account when deciding on a child's placement. An oral functioning measure is perhaps the more valid indicator of how well

the child will be able to cope in a regular classroom, but the more objective measure should not be ignored.

Second, we would not really advocate the integration of any hearing impaired child without some type of specialized help, at least to the extent of providing a periodic check on his or her progress. The data on the mildly impaired show that children who should succeed sometimes do not, especially at the secondary level. We would therefore recommend that any child fitting the criteria for inclusion in this study (see p.15) be given some type of special help. At the least, the progress of the student should be checked at regular intervals, say the beginning of the primary grades, the beginning of the junior grades, and again at either the end of the intermediate grades or the beginning of secondary school.

Third, the data on the severely and profoundly deaf children in the study shows that they can be integrated as well, as long as their oral functioning is good. However, when the integration occurred without special support, exceptional parents, early diagnosis, and a high degree of specialized help in early childhood appear to have been present. If children with severe and profound losses do require specialized help later on in school, periodic help by an itinerant teacher will probably not suffice. More intensive help, such as was provided to the Milton group, will be required.

2. Home Environment

We have already seen that an exceptional home environment is required for the full integration of severely and profoundly deaf children. There is even some indication that fully integrated children with lesser degrees of loss require more than the usual level of support from their parents.

However, provided that the school provides supportive services, "exceptional" parents are not required. But the parents must still be "supportive." They should have gone quite far through the educational system themselves, they should have high expectations for their child's success, and they should give the child some help at home and keep in touch with the school. It is not known to what extent this level of support is typical of parents.

3. IQ

Normal intelligence seems to be another prerequisite for successful integration. Now "normal" intelligence ranges approximately from 85 to 115. However, we have seen evidence that students scoring at the bottom end of the normal range may have difficulty in the regular classroom. Therefore, it is perhaps safer to establish a floor of 95 as a criterion for integration. When the IQ is lower, additional support may be required, either from the parents or the school.

4. Age at Which Hearing Aid Received

The data on age of diagnosis and age at which an aid was fitted was spotty. In most cases these factors did not differentiate successful from unsuccessful children. However, very late diagnosis signals risk, say, diagnosis which occurs after the primary years. The two severely and profoundly deaf groups had earlier diagnosis and fitting with an aid. However, it is difficult to say whether or not this was instrumental in their success since all children with greater degrees of loss tended to be identified earlier.

Overall we might conclude that late diagnosis should signal caution. Age of diagnosis or fitting with an aid should not of itself be used to decide against integrating a child, but it should operate as a signal to scrutinize the child's performance more carefully.

5. Age

There is some indication that older students may be more at risk than younger ones. We have seen this with itinerant students at the elementary level, among whom younger students were more successful than the older ones. It is interesting to observe that while children receiving itinerant help at the elementary level had losses ranging into the severe category, itinerant students at the secondary level really only ranged into the moderate category. Students with severe losses were almost all partially integrated. Of course, almost all of these secondary students were in a 4 or 5 year programme, but it is still probably wise to be more cautious in integrating the older student even into less demanding programmes.

6. Language Background

Most children in this study came from English speaking homes, and the results, therefore, really only apply to such groups. The data revealed few differences between children from English and non-English speaking homes. However, the group of non-English background children was small. Further data would have to be collected before concluding that language background should be a criterion for integration.

7. Teacher Knowledge

There is some indication that a teacher's knowledge of hearing impairment is important to the child's success. Certainly every effort should be made to prepare teachers as well as the rest of the class for the entry of a hearing impaired child. There is evidence that this is especially important when the loss is mild or marginal, and thus relatively invisible.

The Price of Failure

Integration then seems to be a viable alternative for some hearing impaired children, regardless of their degree of loss, provided that they have good oral skills, intelligence at the high average level, supportive parents, itinerant services, and informed teachers.

However, the questions remains as to what should be done when not all of the signals are "go". In general, the overall results of integration seem to be positive. It is thus possible that a child is "unsuccessfully" integrated, but is still progressing faster than he or she would be doing in a segregated class.

However, there may be a price to pay in terms of the child's own sense of well-being and social adjustment. Table 11 gives the average self concept score and Bristol and Social Adjustment Guide Score for successful and unsuccessful children in each programme and at each level.

It can easily be seen that in most cases successful children had higher self concept scores, although only two of the comparisons reached significance. Likewise, successful children generally had fewer signs of maladjustment than children who were unsuccessful,

TABLE 11

AVERAGE SELF CONCEPT AND BRISTOL SOCIAL ADJUSTMENT GUIDE SCORE FOR SUCCESSFUL AND UNSUCCESSFUL CHILDREN BY PROGRAMME AND LEVEL

Group	Self Concept		Social Adjustment	
	Successful	Unsuccessful	Successful	Unsuccessful
Elementary				
Fully Integrated	38.1	35.5[a]	6.1	11.1[c]
Itinerant	37.3	33.7	5.2	20.0[d]
Secondary				
Fully Integrated	18.0	21.6	4.9	4.1
Itinerant	24.6	24.9	3.1	8.7
Partially Integrated	20.9	16.5[b]	2.9	4.3

a $F = 2.844$; $df = 1/73$; $p \leq .05$; $r^2 = .04$.

b $F = 2.982$; $df = 1/9$; $p \leq .10$; $r^2 = .25$.

c $F = 7.432$; $df = 1/72$; $p \leq .05$; $r^2 = .09$.

d $F = 15.49$; $df = 1/28$; $p \leq .05$; $r^2 = .36$.

although, again, only two of the comparisons reached significance. These two, however, are cause for some concern. Fully integrated children who were unsuccessful had an average score of 11.1, which indicates that they were somewhat "unsettled." Unsuccessful students who were integrated with itinerant support scored 20.0, which is the floor for maladjustment.

However, poor performance in a hard of hearing class was also associated with poorer adjustment. If we compare students whose reading scores were more than two years below age level, with those who were achieving at a higher level, we find that there were more signs of maladjustment among the poor readers (14.6 vs. 6.8).[95]

95 Social adjustment (elementary - hard of hearing classes) - good vs. poor readers:
$F = 4.384$; $df = 1/34$; $p \leq .05$, $r^2 = .11$.

However, evidence presented in Chapter VI suggests that problems of adjustment and self esteem are greater in integrated settings. At the elementary level, itinerant students as a group had somewhat more signs of maladjustment than did children in hard of hearing classes. At the secondary level, partially integrated students had fewer signs of maladjustment than either of the two integrated groups, and itinerant students showed more signs of maladjustment the longer that they were integrated.

The data on this question are really inconclusive. It appears that children with a hearing loss may have personal problems regardless of their school placement. These problems may stem from the child's knowledge of his or her general low level of achievement, from other difficulties associated with the handicap, or from the types of pressures which create difficulties for any child. But the data at least suggests that integration may exacerbate these difficulties, and it is certainly wise to be cautious in this respect when integrating children with a hearing loss.

Recommendations for Use of Criteria

It is possible to integrate children who meet the criteria shown in Table 10 and as discussed above with a fair degree of confidence that they will be successful. Children who do not meet these criteria are less likely to succeed in a regular classroom, and are likely to either bring with them or develop problems of lowered self esteem or poorer social adjustment. However, there is a possibility of sample bias in the present study, and the results therefore should be interpreted with caution. Future integration programmes should involve careful selection and follow-up of children.

It is possible that other types of services might be developed which would allow children not meeting the criteria to be successfully integrated. One possibility is to provide even more intensive special services within the regular school. Two approaches that have been used in other programmes are the resource room and the introduction of paraprofessionals into the regular class.

Another possibility is the provision of interpretive services, particularly for children who do not have good oral functioning. If the child cannot comprehend what is going on in class, there is no way he or she can succeed. However, this difficulty can be circumvented by providing oral or manual interpretation and, for the older child, note-taking services. Such services would be designed for the profoundly deaf. At the present time this type of resource is only available in Ontario at the post-secondary level. However, there is no inherent reason why such services could not be useful at an earlier stage.

Still another possibility is to provide group as opposed to individual integration. Integration into a class or school with one or two other hard of hearing children is a way to circumvent the social isolation that would otherwise occur. Another approach is to assign a normally hearing "buddy" from the regular class to the hard of hearing child.

Any programme of integration, particularly for the child who is more at risk, should be combined with some really hard-nosed assessment of the child's progress. This must probably be done by someone other than the regular classroom teacher who is able to disentangle the effects of hearing loss from other intellectual, personality, and social variables.

Any assessment should evaluate the child's progress with reference to progress achieved during previous years. For example, a normal child should gain one year in reading for every year in school. For a child with a hearing loss, however, this may not have been the case. A signal, then, of a successful placement is when the child's rate improves. A signal of failure is a decline in the rate of progress.

It is also important that evaluation of the child include an assessment of how well he or she is progressing socially in the setting. There is also a need to provide psychological services for hearing impaired children which recognize the peculiar difficulties stemming from their handicap.

Recommendations for Future Studies

This study has a number of limitations which might be rectified by further research:

(1) The focus here has been the hard of hearing or deaf child with good oral functioning. If, in the future, children with less oral skills are integrated, their progress should be carefully followed.

(2) This study has severe sampling problems in that there are differences among children on the various programmes. What is needed, from a research point of view, is a longitudinal study to measure the rates of progress achieved in various settings.

(3) This study has ignored the multiply handicapped child. A child who is retarded as well as hearing impaired can doubtless not be integrated into a regular class. However, will this child do better in a class for the hearing impaired, or is a class for retarded hearing impaired children required? Children with other additional handicaps may also have potential for integration.

(4) It would appear useful to carry out further developmental work on the aural/oral functioning test. This instrument, although very useful for research purposes, may be inadequate for individual diagnosis.

(5) Data presented here suggest that mildly handicapped children encounter greater difficulties in regular classes than children with moderate handicaps. The present study was unable to determine whether or not this was an artifact of placement procedures, or represented some particular problem in the interaction between mildly impaired children and their teachers and classmates. This is an area which should be clarified since those children would seem to have the greatest potential for successful integration.

(6) There is some indication that children from non-English speaking homes are less likely to be candidates for integration. However, because of the small size of the non-English speaking sample, it is difficult to draw firm conclusions. Further detailed study of this area is required.

Summary

A child was deemed to be successful in his or her placement if the teacher reported that the overall level of performance was at or above the class average and if the child did not score more than two years behind his or her agemates in reading. About two-thirds of the students met these criteria. A comparison of successful and unsuccessful children, together with a knowledge of the characteristics possessed by the group as a whole, was used to develop criteria for integrating students into regular classrooms.

At both the elementary and secondary level, some students can be successfully integrated without special support whose pure tone audiograms show losses into the moderate range. However, aural and especially oral functioning must be at a high level. The student must come from a home in which the parents are able and willing to be supportive. Such parents will likely be English-speaking, will have at least attended or graduated from high school, will expect the student to graduate from high school or attend college, will give some help to the student at home, and will keep in touch with the school. The student to be integrated will have an IQ no lower than 95, and will likely have been diagnosed and fitted with an aid before the end of the primary grades. Some students who fit this pattern will require itinerant support at the secondary level.

In view of the fact that some children with even very mild losses were found to be educationally retarded, we recommend that any child with a hearing loss who is an integrated setting should be periodically checked for academic progress.

Children with severe losses can be integrated into regular classrooms at the elementary level if their aural and oral functioning skills are good, and if they receive the special services of an itinerant teacher. The other characteristics relating to home environment, IQ, age of diagnosis and fitting with an aid are as described above. In addition, the teacher of a child with this degree of loss should be well informed about the nature of hearing impairment.

Severely and profoundly deaf children may also be able to be integrated at the elementary level with special support. However, their aural and oral skills must be at as high a level as those with more moderate losses, and they will probably require even more intensive specialized help. In addition, they must also fulfill the other criteria mentioned above.

It is doubtful whether students with severe losses can be integrated into a 4 - 5 year programme at the secondary level even with itinerant support. Such students are only likely candidates for partial integration. Even for partial integration, however, aural and oral functioning must still be high, and home environment, IQ, and age of diagnoses must all be favourable as described above.

Some children with severe and profound losses were found to be successfully integrated without specialized support, but the parents of these children provided an exceptional home environment and degree of educational support, and the children had received extensive special help during their preschool years.

It is important that these criteria be used in placing children since there is some evidence that unsuccessful placement tends to result in lowered self esteem and poorer social adjustment. However, there are other types of programmes which might make it possible to integrate children who do not meet the suggested criteria. Some possibilities are the provision of interpretive services, group integration, assigning a buddy, and more extensive tutoring by paraprofessionals.

It is important to keep in mind the possibility of sample bias in the present study. Therefore, future attempts at integration should involve careful selection and follow-up of children.

VIII -- GENERAL SUMMARY

Why Integrate?

Integration, or mainstreaming, is increasingly being advocated as a possible placement for children with a variety of handicaps. Placing handicapped children in regular classrooms has the advantage of exposing them to a normal academic and social environment. The only "abnormality" with which the child then has to deal with is the primary disability. He or she is not further handicapped by abnormal surroundings.

The primary reason for integrating hearing impaired children is to place them in a normal language environment, thus providing an entire class of children as well as the teacher who can serve as language models and who will maximize normal language stimulation.

How to Integrate

Many types of programmes have been developed to facilitate integration. Some programmes only extend integration into social areas. Handicapped children receive all of their formal schooling within a segregated classroom attached to a regular school, but have contact with normal peers during lunch, at recess, on the school bus, or during any extracurricular activities that occur in the school. Other programmes extend integration into practical subjects such as home economics, shop, and physical education. Some programmes group handicapped with normal children for the entire range of school activities -- academic as well as practical and social.

Programmes also differ in the amount of time that the handicapped child spends with normal children. In full segregation, the child's only associations are with other handicapped children. In partial segregation, he or she is with a special group most of the time, but there are some opportunities for contact with normal peers. These would almost always be restricted to social or practical areas. In partial integration, the situation is reversed with the child

spending most of the time with a regular group of children, and only a small proportion with a special group. Under these conditions, integration occurs in academic as well as nonacademic activities. Finally, there is full integration, in which all of the child's peer contacts are with normal children, and in which the child is integrated for all activities.

Partial segregation and partial integration are usually done on a group basis, that is, an entire class of handicapped children are introduced into a school, and will participate together in any activities that occur with normal children. Full integration usually occurs on an individual basis, that is, a single child is integrated into the neighbourhood school. However, these are not necessarily the only possibilities. In particular, it may be useful to have a small group of handicapped children fully integrated together into a school, although they may or may not be in the same class. Such a plan serves two purposes: it helps to alleviate the social isolation which sometimes occurs, and it allows the more efficient distribution of special resources.

Handicapped children, even those who are fully integrated, frequently need special help. This may come from people who are specialists in the particular handicap, or from people with more general skills. With regard to the hearing impaired child, many programmes employ an itinerant teacher who is a specialist in hearing impairment, and who is prepared to deal with a wide range of problems typically associated with the handicap. The hearing impaired child may also require the help of people who are available to any child in the school system - psychologists, speech therapists, remedial reading teachers, etc.

There is great variety in the manner in which specialists in hearing impairment, or any other handicap, may be made available. Their presence may be episodic, only occurring at infrequent intervals, generally when the handicapped child is first introduced into the class or when the regular teacher becomes aware of a particular problem. Special help may occur periodically. This is typically the case with itinerant teachers who visit the child in the regular class several times a month, or even more frequently. Special help may also be

continuous with a specialist present full-time in a school in which a number of children are integrated.

The type of help given by the specialist also varies. Sometimes the major focus of the help is the teacher, improving her understanding and skill in dealing with the child. In other cases, the major focus is on helping the child directly. This may be done in several ways, through counselling and advice, through tutoring in specific subjects, through language training, or through the provision of interpreting and notetaking services.

One very important approach to integration is the "unit." In the unit concept, one or more classes of handicapped children are attached to a regular school and are staffed by teachers who are trained in that speciality. From the unit, children can be integrated into the activities of the regular school to whatever extent they are able. Integration can occur on an individual or a group basis. Some children may spend all of their time in the unit, and others practically none. The unit teacher can function as an advisor to regular teachers, as a withdrawal teacher for children who are partially integrated, or as the major classroom teacher for children who are partially segregated.

Integration of the Hearing Impaired in Ontario

A variety of programmes are available in Ontario. Each programme is a particular combination of the options described above. Several of them were the subject of a recent research study on the hearing impaired child

Some children within Ontario are fully integrated into regular classrooms without specialized support services. In some cases these children are fully integrated because it was felt that this was the best placement for them. In other cases full integration occurred because the child had not been identified as having a loss or because an alternative placement was not available.

Some children are fully integrated with the support of an itinerant teacher who provides whatever special help is required. This varies from periodic follow-up on the child's progress to weekly or more than weekly tutoring in specific subjects or language skills.

Ontario also has several examples of the unit approach to integration. The Sir James Whitney School at Belleville has several classes of hard of hearing children who are located in a regular elementary school. The Toronto Board of Education has a unit for hard of hearing and deaf students in a composite secondary school, and several classes of hard of hearing and deaf students in an elementary school. Sudbury has a unit at both the elementary and secondary level. The Metropolitan Toronto School for the Deaf is an example of an entire special school attached to a regular elementary school in order to facilitate integration.

The Ernest C. Drury School in Milton has developed a variant of the unit approach. At both a junior and senior level, several hard of hearing and deaf students are fully integrated into a regular school, with a trained teacher of the hearing impaired available on a full-time basis. This teacher follows students into the regular class, and provides whatever special help is required. This "unit" is unique in that virtually no instruction is directed at the hearing impaired students as a group. Some of these students are assisted by an individual microphone-reception unit.

Within Metropolitan Toronto, elementary children may also be placed in special classes for the hard of hearing. Although these classes are located in regular schools, they are relatively self-contained, and little more than social integration occurs. London has a similar programme, with an emphasis on integrating children out of the special class as soon as they are able. Most children are fully integrated by fourth grade, although the special class is available through Grade 6.

Evaluation of Integration in Ontario

Research involving several of these programmes provides some evidence that integration is beneficial to the academic and language development of hearing impaired students. However, this evidence is far from unequivocal, and there is also evidence that when a student is not succeeding in his or her placement, the academic difficulties are likely to be compounded by problems of self esteem and social adjustment. While this seems to be the case regardless of the type of

programme in which the student is placed, it appears to be more severe in the case of students who are more fully integrated. Thus, it is important that students only be integrated if they can succeed in that placement.

Criteria for Integration

Oral Skills

The prime requisite for successful integration is not hearing loss per se, but the child's ability to comprehend speech. Of course, the more hearing a child has, the easier this task becomes, and the more likely it is that a child will be able to develop the necessary language skills. But some severely and profoundly deaf children have highly developed lipreading skills which compensate for their poorer hearing.

However, even when oral skills are highly developed, most children with severe and profound losses will require a great deal of special help in school, either from the school itself or from their parents. At the secondary level, they may be only able to accept partial integration. Children with moderate or marginal losses can usually be integrated if an itinerant teacher is available to provide periodic help. Most children who can be fully integrated without special help will only have losses in the mild or marginal category. But even these children should have periodic follow-up to make sure that they are continuing to progress in the setting. Depending on the particular type of loss and their personal history, even children with only very mild losses may have difficulty in school.

Achievement

It goes without saying that a child should not be integrated unless his or her level of achievement is within the range of the class into which he or she is being placed. Reading is especially important, and a child should be no more than two years behind the expected level for his or her age.

Home Environment

Another requirement for successful integration is parental support. The parents of a child who is a good candidate for integration will likely be English-speaking, will have at least attended and

preferably graduated from high school, will expect their child to attend college, will have given some help to the child at home, and will keep in touch with the school. When parents exceed these criteria, especially in the degree of help they provide and their involvement with the school, the child may require fewer special services from the school itself.

IQ

Intelligence, as measured by a performance test, should be at the middle or high end of "average," i.e. above 95. A child with a lower level of intelligence is less likely to succeed in the regular classroom. On the other hand, children with greater losses do not need to be more intelligent than children whose handicap is more mild. Provided that oral skills and parental support are adequate, a severely deaf child and one who has only a marginal loss, both with IQ's of 100, are equally promising candidates for integration. However, the more severely impaired child will continue to require more support services.

Diagnosis and Hearing Aid History

Children who are likely to succeed in an integrated setting will likely have had their hearing loss diagnosed and, if it is indicated, will have been fitted with an aid by the end of the primary grades. Diagnosis and fitting with an aid at an earlier age will likely be required if the child is severely or profoundly deaf. However, age of diagnosis and fitting should not of themselves be criteria for placement. They do give additional cause for concern, and indicate that the child's performance and home environment should be more carefully scrutinized.

Classroom Preparation

It is important that the regular classroom teacher be given explicit instruction in the problems and management of hearing impairment. Teachers will not, generally speaking, acquire the necessary knowledge on their own from mere contact with such a child in their class. Areas that need to be stressed with the classroom teacher are the limitations of hearing aids and the comprehensive nature of the effects of hearing impairment on language development.

The Cost of Integration

Integration is not necessarily a less costly method of educating the hearing impaired child. Full integration, or integration with the periodic services of an itinerant teacher will generally represent a saving over placement in a hard of hearing class or a school for the deaf. However, the saving may not be as great as anticipated, since such children will more often require the services of other school professionals, such as psychologists, reading teachers, speech therapists, etc.

The successful integration of severely and profoundly deaf children, however, can likely only be achieved when a specially trained teacher of the deaf is continually available in the school to provide whatever type and intensity of help a child requires. Particularly at the secondary level, integration may only be possible for subject areas in which the student is especially strong, and this requires a great deal of supervision due to the rotary nature of the secondary programme.

It is difficult to provide an estimate of the relative costs of various programmes, since these are so dependent on class size, the salary level of the teachers and other professionals employed, and the amplification equipment that is usually installed in special units.

Other Approaches to Integration

The guidelines developed here are based on the study of programmes currently operating in Ontario. It is entirely possible that other programmes could be implemented which would allow children to be successfully integrated who do not meet these criteria. Some possibilities are the introduction of paraprofessionals into the classroom, more specialized psychological services, and interpreting and note taking services.

A Cautionary Note

On the basis of the results of the study conducted in Ontario, we suggest that integration is the preferred placement for children meeting the criteria developed. However, no study done to date has provided unequivocal support for integration. Each study contains the possibility for sample bias of one type or another. Therefore, in implementing new integration programmes, extreme care should be taken.

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APPENDIX A

Parental Letter and Consent Form

THE BOARD OF EDUCATION FOR THE CITY OF TORONTO
155 College Street, Toronto M5T 1P6, Canada, 362-4931

Dear Parent:

The Toronto Boards of Education are co-operating with the Research Department of the Toronto Board of Education in conducting a study of hearing impaired children in Metro Toronto Schools. This study is being done for the Ontario Ministry of Education, and should be of value to school boards across the province, as well as in Toronto. The purpose of the study is to see how well hard of hearing children are doing in school, what types of special help they receive, and how services to such children could be improved.

Service presently provided to children in this study will not be affected in any way. However, we are very interested in examining the results with a view to the future.

We understand that _____ has been identified as hearing impaired and is now attending _____ school. We would like your permission to administer several educational tests to your child. This will require about 3 to 4 hours of school time and will be spread out over several days. We would also like to obtain information from your child's teacher on how well he/she is doing in school, to talk with you by phone to find out more about his/her hearing and how you have helped him/her, and to consult his/her audiological record.

If you are willing to let your child participate in this study, please indicate your approval on the attached form, and return it in the enclosed envelope. If you do not wish your child to participate, please indicate this also and return the form. If you have any questions, don't hesitate to contact me at 362-4931, Ext. 391. Thank you for your co-operation.

Yours sincerely,

Barbara Klein,
Project Director.

per:
Carol Reich, Ph.D.,
Research Associate,
Toronto Board of Education.

Duncan Green, Director of Education Edward N. McKeown, Associate Director of Education
Gertrude M. Fait, Superintendent of Professional Services Mitchell Lennox, Superintendent of Curriculum & Program
Donald E. Ryerson, Superintendent of Personnel Harry S. Facey, Comptroller of Buildings and Plant David S. Paton, Comptroller of Finance

THE BOARD OF EDUCATION FOR THE CITY OF TORONTO
155 College Street, Toronto M5T 1P6, Canada, 362-4931

PARENTAL CONSENT FORM FOR

_____
Name of Child

_____
Name of School

Dear Ms. Klein:

I have received information about the study of hearing impaired children in the Metropolitan Toronto school system. I hereby give my permission to allow my child to participate in the study.

NAME _____
Please Print

DATE _____

SIGNATURE _____

OR

I am NOT willing to have my child take part in the study. I hereby do NOT give my permission.

NAME _____
Please Print

DATE _____

SIGNATURE _____

Duncan Green, Director of Education Edward N. McKeown, Associate Director of Education
Gertrude M. Fatt, Superintendent of Professional Services Mitchell Lennox, Superintendent of Curriculum & Program
Donald E. Ryerson, Superintendent of Personnel Harry G. Facey, Comptroller of Buildings and Plant David S. Pates, Comptroller of Finance

APPENDIX B

Aural/Oral Functioning Tests

AURAL AND ORAL FUNCTIONING TEST

Procedure for Administration:

Tester and subject will sit in a face-to-face position, approximately 1 1/2 feet apart. The first half of the test will be administered with the child allowed to watch the tester's face, thus providing him with both auditory and visual cues (oral test).

The second half of the test, equivalent in terms of format and content to the first, will be administered while the child is wearing opaque sunglasses, thus compelling him to rely solely on auditory information (aural test). Testing will be terminated for any child who answers the first four aurally presented items incorrectly.

For half of the children, Form A is administered as the oral and Form B as the aural form. For the remaining children, Form B serves as the oral and Form A as the aural form.

I -- DESCRIPTIVE WORDS

Form A 1) POINT TO YOUR EYES.

2) POINT TO YOUR ARM.

Form B 1) POINT TO YOUR FEET.

2) POINT TO YOUR TEETH

II -- PICTURE IDENTIFICATION

Oral Presentation: Cards are supplied with three pictures placed randomly thereon. The tester then follows this procedure: card is exposed allowing child to scan individual pictures; then card is covered while item is presented; then pictures are re-exposed to allow child to make choice.

Aural Presentation: As above, except child puts on opaque sunglasses while item is presented. Tester taps subject on shoulder to signal removal of glasses. Child then re-examines pictures and makes a choice.

Form A 1) POINT TO THE BIRD

2) POINT TO THE HAMMER

(Choices: pictures of a bird, hammer and a dog)

Form B 1) POINT TO THE HOME.

2) POINT TO THE BOAT.

(Choices: pictures of a television, a boat and a home)

III -- ACTIVITIES

Form A 1) CAN YOU JUMP? (Child is asked to:) JUMP!

2) CAN YOU WALK? (Child is asked to:) WALK!

Form B 1) CAN YOU OPEN THE DOOR? (Child is asked to:) OPEN THE DOOR!

2) CAN YOU COME HERE? (Child is asked to:) COME HERE!

IV -- ANIMALS

Toy animals are placed in front of the child and the tester asks that the child:

Form A 1) GIVE ME THE COW.

2) GIVE ME THE PIG.

Form B 1) GIVE ME THE HORSE.

2) GIVE ME THE SHEEP.

V -- POINT TO THE PICTURE THAT GOES WITH WHAT I SAY:*

(Forms A and B follow)

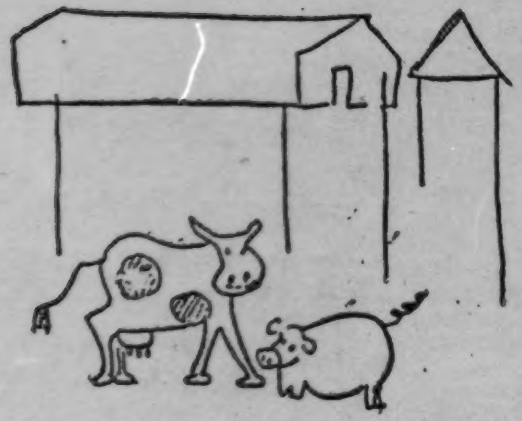
Procedure: see procedures for Section II

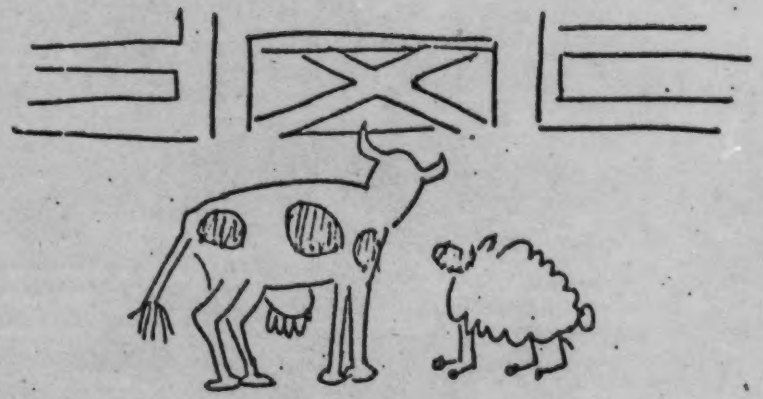
---

* From the Cra'g Lipreading Test.

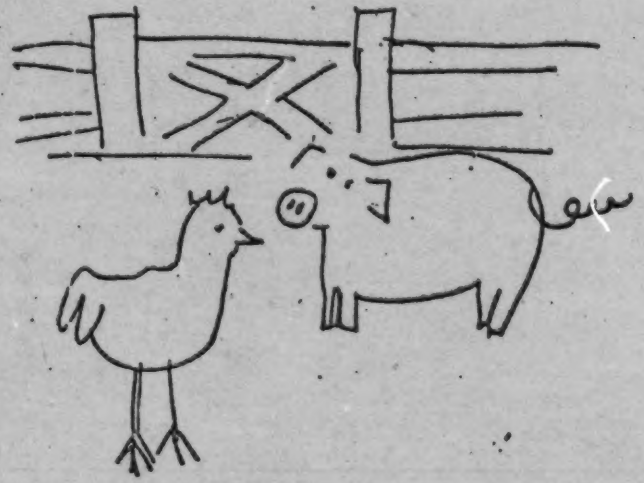
FORM A

POINT TO THE PICTURE THAT GOES WITH WHAT I SAY:

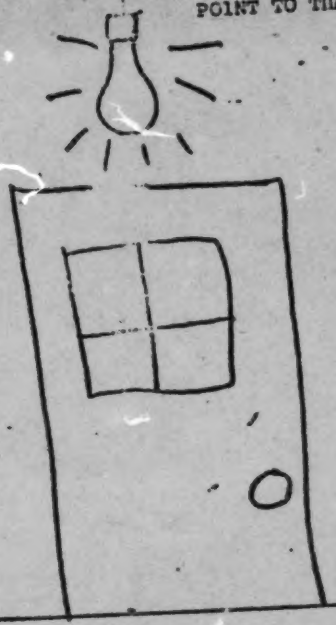


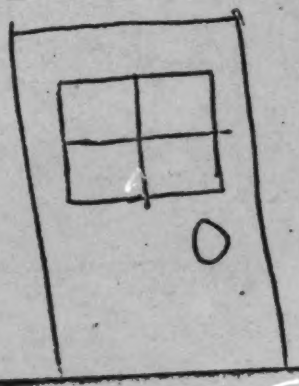


A COW AND A PIG ARE NEAR THE GATE.



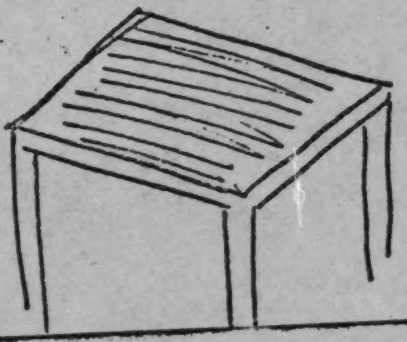
POINT TO THE PICTURE THAT GOES WITH WHAT I SAY:





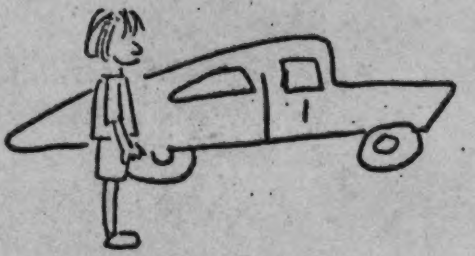
142

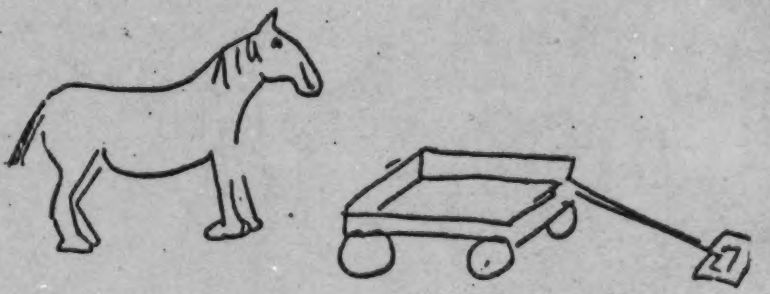
A LIGHT IS OVER A TABLE.



143

POINT TO THE PICTURE THAT GOES WITH WHAT I SAY:





A HORSE IS STANDING BY A NEW WAGON.

POINT TO THE PICTURE THAT GOES WITH WHAT I SAY:

A GIRL IS JUMPING.

146

147

POINT TO THE PICTURE THAT GOES WITH THE STORY.

One morning Larry was so sleepy that he put his gloves on his feet and his boots on his hands and went outside.

POINT TO THE PICTURE THAT GOES WITH THE STORY:

Steve is fishing with his new fishing pole. His father will not let him go to the lake, so he has to fish in a bucket. He hasn't caught any fish yet.

150

151

POINT TO THE PICTURE THAT GOES WITH THE STORY:

OLD MOTHER HUBBARD WENT TO THE CUPBOARD. WHEN SHE OPENED IT, ALL SHE FOUND WAS A CAN OF DOG FOOD.

POINT TO THE PICTURE THAT GOES WITH THE STORY:

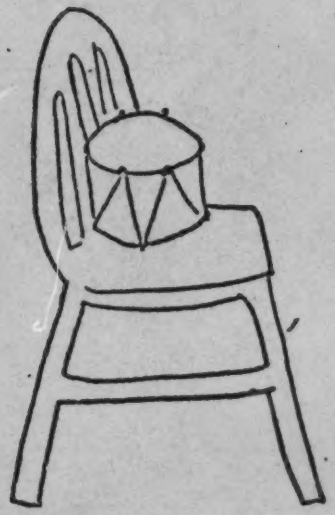
Mr. Smith may find that he cannot chop his wood unless he fixes the handle on his axe.

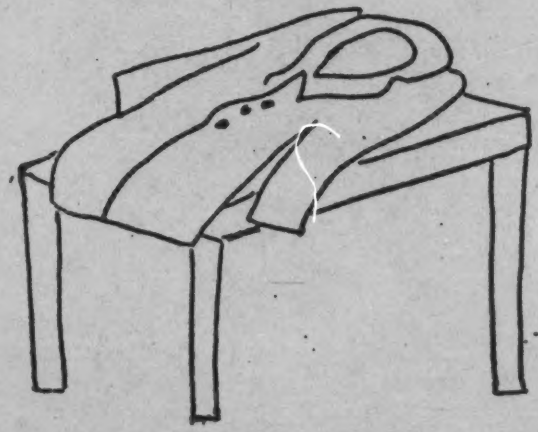
154

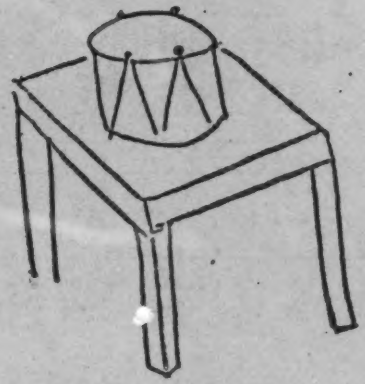
155

FORM B

POINT TO THE PICTURE THAT GOES WITH WHAT I SAY:







A DRUM IS ON THE TABLE.

POINT TO THE PICTURE THAT GOES WITH WHAT I SAY.

A MAN IS PICKING AN APPLE.

159

160

POINT TO THE PICTURE THAT GOES WITH WHAT I SAY.

ONE STAR IS IN THE SKY.

POINT TO THE PICTURE THAT GOES WITH WHAT I SAY:

THE WOMAN HAS LONG HAIR AND A SHORT DRESS.

163

164

POINT TO THE PICTURE THAT GOES WITH THE STORY:

165

Mary's mother bakes cookies once a week. After the cookies are cool, Mary helps her mother by putting the cookies in the cookies jar.

166

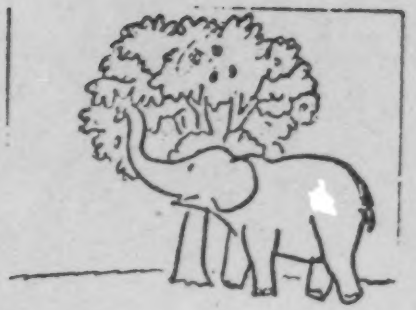
POINT TO THE PICTURE THAT GOES WITH THE STORY:

167

A lion tried to climb a small tree. The tree bent over but it didn't break.

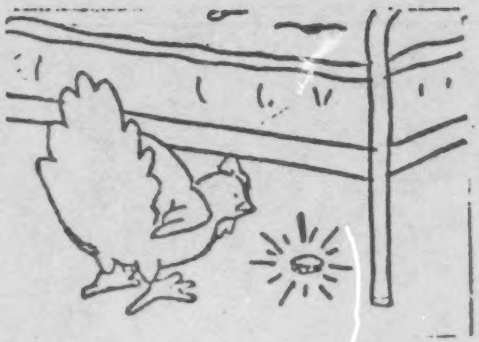
168

POINT TO THE PICTURE THAT GOES WITH THE STORY:



Once upon a time an elephant tried to hide in a cherry tree. He wasn't very well hidden because his feet and his trunk kept hanging out. Everyone knew he was there.

POINT TO THE PICTURE THAT GOES WITH THE STORY:



A checken found a dime in the garden. It bought an ice cream bar with it.

171

172

VII -- SILLY STORIES

Procedure: The tester introduces the concept of "silly" through providing illustrations of the following form: "I have four arms. -- That's silly!" "I have two arms. -- That's not silly." The child is asked to tell why the stories are silly.

The test is administered by asking the child to "tell me if you think these stories are silly or not silly."

Form A

1) NELLIE IS A PRETTY GIRL. SHE WAS LONG HAIR AND SQUARE EYES.

2) ONE DAY BILLY WAS HUNGRY. HE ASKED HIS MOTHER FOR A NICKEL SO THAT HE COULD BUY A BALLOON TO EAT.

3) BOB LOVES CATSUP. HE LIKES THE WAY IT TASTES, BUT HE ALSO LIKES THE WAY IT MAKES HIS FOOD LOOK BLUE.

4) DUCKS LIKE THE RAIN. THEY LOVE WATER AND THEY LOVE TO SPLASH AROUND IN RAIN PUDDLES IN THEIR RED RUBBER BOOTS.

Form B

1) LIONS ARE VERY STRONG ANIMALS THEY ARE EASY TO SEE BECAUSE THEY ARE BIG, WEAR RED PANTS AND HAVE THICK FUR.

2) WHEN WINTER COMES, IT GETS VERY COLD OUTSIDE. ANIMALS GET COLD JUST LIKE PEOPLE. THAT IS WHY A HORSE SHOULD ALWAYS WEAR MITTENS WHEN IT GOES OUT IN THE SNOW.

3) JIMMY WORE ALL NEW CLOTHES ON HIS FIRST DAY AT SCHOOL. HIS MOTHER DRESSED HIM UP IN A NEW PAIR OF SHOES, NEW SOCKS, A DRESS, A JACKET AND A HAT.

4) SUSAN IS A LUCKY GIRL. ON HER WAY TO SCHOOL ONE DAY, SHE FOUND A SHINY BROWN DIME IN THE GROUND.

VIII -- THIS PART IS CONCERNED WITH ONE WORD PLACEMENT:

Procedure: Pictures are provided for the child to view and tne following questions are asked:

Form A

1) YOU CAN'T CLIMB IT, SO IT MUST BE THE _____?

(pictured alternatives includeda tree, a lake and a mountain.)

2) IS DOESN'T TALK, SO IT MUST BE THE _____?

(pictured alternatives included a desk, a radio and a television.)

Form B

1) YOU WEAR IT, BUT IT'S NOT THE SHOE _____?

(pictured alternatives included a shoe, a hat, and a hot dog.)

2) IT'S GOOD TO EAT, BUT IT'S NOT THE APPLE _____?

(pictured alternatives included a dress, an apple, and a birthday cake.)

APPENDIX C

Elementary and Secondary Self Concept Scales

Self Concept Scale - Elementary

Read: We're going to play a game today to find out how you feel about school. You know that boys and girls sometimes put on masks to look like other people. Sometimes clowns paint their faces to look happy or sad. You change your face a few times every day. I want you to think of the faces that you feel like wearing when things happen to you.

There are three faces on the front page of your booklet. One of the faces has a big smile. If someone gave you a piece of candy, you might wear a big smile. Put your finger on the smiling face. (Point to the smiling face.) Fine. But, if you fell down hard on the side-walk, you might wear a sad face. (Point to the sad face.) Can you find the sad face? Put your finger on the sad face. The face in the middle is in between, it isn't really happy and it isn't really sad. It's the face you would wear when you're feeling between happy and sad. (Point to the neutral face.)

To pick the face that you would wear, you put an "X" on that face. Like this. (Demonstrate on your sample inventory.)

Now, I want you to answer this question, "How do you feel about going shopping?" What face would you wear? Put an "X" on it. If you like going shopping most of the time, you might pick the face with a smile. If you don't like going shopping, you might pick the sad face. If you're not sure, sometimes you like to go shopping and sometimes you don't, you might pick the face in the middle. Whatever face you pick is all right.

Now, turn the page and let's start.

Put your finger on #1 at the top of the page and listen to the question _____.

Now move down to #2.

Periodically repeat the meaning of the 3 faces as a reminder.

EXAMPLE: HOW DO YOU FEEL ABOUT GOING SHOPPING WITH YOUR MOTHER?

---

1. HOW DO YOU FEEL ABOUT SCHOOL?

2. HOW DO YOU FEEL WHEN YOU FALL DOWN AND HURT YOURSELF?

3. HOW DO YOU FEEL ABOUT SHOWING YOUR SCHOOL WORK TO YOUR FRIENDS?

4. HOW DO YOU FEEL ABOUT THE WAY THE CHILDREN IN SCHOOL TREAT YOU?

5. HOW DO YOU FEEL WHEN THE TEACHER TELLS YOU TO DO SOMETHING?

6. HOW DO YOU FEEL WHEN YOU THINK OF ALL THE CHILDREN IN THE CLASS WHO LIKE YOU?

7. HOW DO YOU FEEL WHEN YOU DON'T HAVE TO GO TO SCHOOL?

8. HOW DO YOU FEEL ABOUT BEING WITH OTHER CHILDREN IN THIS CLASS?

9. HOW DO YOU FEEL ABOUT SHARING YOUR FAVORITE TOY WITH OTHER CHILDREN IN THIS CLASS?

10. HOW DO YOU FEEL ABOUT PLAYING WITH CHILDREN WHO ARE YOUNGER THAN YOU?

11. HOW WOULD YOU FEEL IF YOU NEVER HAD ANYONE TO PLAY WITH?

12. HOW DO YOU FEEL WHEN YOU TRY TO READ OUT LOUD?

13. HOW DO YOU FEEL ABOUT SCHOOL WORK?

14. HOW DO YOU FEEL WHEN THE TEACHER ASKS YOU TO SPELL A WORD OUT LOUD?

15. HOW DO YOU FEEL ABOUT THE WAY YOU GET ALONG WITH THE CHILDREN IN YOUR CLASS?

16. HOW DO YOU FEEL WHEN YOU'RE ASKED TO PUT WORK ON THE BLACKBOARD?

17. HOW WOULD YOU FEEL IF YOU HAD TO MOVE TO ANOTHER SCHOOL?

18. HOW DO YOU FEEL ABOUT TRYING NEW THINGS AT SCHOOL?

19. HOW WOULD YOU FEEL IF ONE OF YOUR FRIENDS MOVED AWAY?

20. HOW DO YOU FEEL WHEN YOU WORK WITH NUMBERS?

21. HOW WOULD YOU FEEL IF YOU WERE A DIFFERENT PERSON?

22. HOW DO YOU FEEL WHEN GROWN-UPS TALK TO YOU?

23. HOW WOULD YOU FEEL IF YOU LOST YOUR FAVORITE TOY?

24. HOW DO YOU FEEL WHEN YOU DO HOMEWORK?

25. HOW DO YOU FEEL ABOUT STANDING UP IN FRONT OF OTHER CHILDREN TO TELL ABOUT SOMETHING?

26. HOW DO YOU FEEL WHEN THE TEACHER ASKS YOU A QUESTION IN FRONT OF THE OTHER CHILDREN?

27. HOW DO YOU FEEL ABOUT OTHER CHILDREN IN YOUR CLASS?

28. HOW WOULD YOU LIKE TO STAY HOME INSTEAD OF GOING TO SCHOOL?

29. HOW DO YOU FEEL WHEN THE TEACHER IS ANGRY?

30. HOW DO YOU FEEL ABOUT THE WAY OTHER PEOPLE LISTEN TO YOU?

31. HOW DO YOU FEEL WHEN IT IS TIME TO GET READY TO GO TO SCHOOL?

Self Concept Scale - Secondary

NAME: _____

SCHOOL: _____ TEACHER: _____

GRADE: _____ DATE: _____

DIRECTIONS:

ON THE FOLLOWING PAGES ARE A SERIES OF STATEMENTS PEOPLE SOMETIMES USE TO DESCRIBE THEMSELVES. PLEASE READ EACH STATEMENT CAREFULLY AND DECIDE WHETHER OR NOT IT IS TRUE FOR YOU.

IF YOU THINK A STATEMENT IS TRUE FOR YOU OR DESCRIBES HOW YOU FEEL MOST OF THE TIME, CHECK THE TRUE SQUARE. IF YOU THINK A STATEMENT IS NOT TRUE FOR YOU OR DOES NOT DESCRIBE HOW YOU FEEL MOST OF THE TIME, CHECK THE NOT TRUE SQUARE.

THERE ARE NO RIGHT OR WRONG ANSWERS, ONLY YOU CAN TELL US HOW YOU FEEL.

	TRUE	NOT TRUE
1. OTHER STUDENTS ARE HAPPIER THAN I AM	☐	☐
2. PEOPLE ARE ALWAYS TELLING ME WHAT TO DO	☐	☐
3. I FIND IT HARD TO TALK IN FRONT OF THE CLASS	☐	☐
4. MOST STUDENTS IN THIS CLASS HAVE MORE FRIENDS THAN I DO	☐	☐
5. I AM VERY GOOD IN MY SCHOOL WORK	☐	☐
6. I WISH I GOT ALONG BETTER WITH THE OTHER STUDENTS IN THIS CLASS	☐	☐
7. MY CLASSMATES THINK I AM A GOOD STUDENT	☐	☐
8. MY TEACHER DOESN'T THINK I AM VERY GOOD IN MY SCHOOLWORK	☐	☐
9. MOST STUDENTS IN THIS CLASS ARE BETTER LIKED THAN I AM	☐	☐
10. THERE ARE LOTS OF THINGS ABOUT MYSELF I'D CHANGE IF I COULD	☐	☐
11. OTHER STUDENTS OFTEN DO NOT APPRECIATE ME.	☐	☐
12. I THINK I'D BE HAPPIER IN ANOTHER CLASS	☐	☐

	TRUE	NOT TRUE
13. SCHOOL WORK IS FAIRLY EASY FOR ME	☐	☐
14. I AM NOT DOING AS WELL IN SCHOOL AS I WOULD LIKE TO	☐	☐
15. I AM OFTEN LONELY IN SCHOOL	☐	☐
16. PEOPLE SEEM TO LIKE MY IDEAS	☐	☐
17. SCHOOL WORK IS FAIRLY DIFFICULT FOR ME	☐	☐
18. I GET UPSET EASILY IN SCHOOL	☐	☐
19. I FORGET MOST OF WHAT I LEARN	☐	☐
20. MOST STUDENTS IN THIS CLASS SEEM TO LIKE ME	☐	☐
21. IT TAKES ME A LONG TIME TO GET USED TO ANYTHING NEW	☐	☐
22. I CAN GIVE A GOOD REPORT IN FRONT OF THE CLASS	☐	☐
23. TEACHERS ALWAYS WANT ME TO DO MORE THAN I CAN	☐	☐
24. I USUALLY DON'T WORRY ABOUT WHAT HAPPENS IN SCHOOL	☐	☐

	TRUE	NOT TRUE
25. IT'S PRETTY TOUGH TO BE ME	☐	☐
26. I FIND IT HARD TO STICK TO ONE PROJECT FOR VERY LONG	☐	☐
27. I AM SLOW IN FINISHING MY SCHOOL WORK	☐	☐
28. NO ONE PAYS MUCH ATTENTION TO ME	☐	☐
29. I OFTEN GET DISCOURAGED	☐	☐
30. IT IS HARD FOR ME TO MAKE FRIENDS IN THIS CLASS	☐	☐
31. IT IS USUALLY MY FAULT WHEN SOMETHING GOES WRONG	☐	☐
32. I SEEM TO GET INTO TROUBLE AT SCHOOL	☐	☐
33. I LIKE ME THE WAY I AM	☐	☐

APPENDIX D

TEACHER KNOWLEDGE QUESTIONNAIRE

(Initial Teacher Questionnaire)

INITIAL TEACHER QUESTIONNAIRE

Teacher _____ Child _____

School _____ Date _____

A. Which of the following sources have provided you with information about the hearing impaired child (you may circle more than one if applicable)?

a. media coverage
b. a handout distributed to teachers who have hearing impaired students in their classrooms
c. a visit with a specialist in the field (e.g. psychologist, itinerant teacher, speech pathologist, school nurse, etc.)
d. courses you have taken
e. an independent search you have made to find out more about hearing impairment
f. other _____

B. For each of the following statements, circle T or F to indicate whether you feel it is "True" or "False."

T F 1. A child with a high frequency loss is more likely to hear vowels than consonants.

T F 2. Listening is a more physically tiring activity for the hearing impaired than the normal child.

T F 3. One of the problems with hearing aids is that background sounds are picked up to the same degree as speech sounds.

T F 4. Hearing impairment typically results in as much of a decrement in performance I.Q. as in verbal I.Q.

T F 5. Hearing aids for the hard-of-hearing and the deaf are as effective as are glasses for the partially sighted.

T F 6. Normally hearing children generally learn new words almost unconsciously by repeatedly encountering them in everyday speech.

T F 7. Weather and minor illness may temporarily compound a child's hearing loss.

T F 8. A child with a loss of 60 db can discriminate only 40% of speech sounds.

T F 9. Hard-of-hearing children may either speak too loudly or too softly.

T F 10. The hard-of-hearing child should be positioned within the room so that he can view his classmates' as well as his teacher's face.

T F 11. A hard-of-hearing child who uses a hearing aid can hear as well from the back as from the front of the room.

T F 12. The hard-of-hearing child should be given a special seat where he has an unobstructed view of the teacher's face.

T F 13. The hard-of-hearing child should not be expected to attempt the same speaking assignments as other children.

T F 14. Hearing impaired children will sometimes pretend to have understood when they have not.

T F 15. It is sometimes necessary to repeat for the hard-of-hearing child what another child says in class.

T F 16. A hearing loss can usually be completely overcome by proper amplification.

T F 17. When a hard-of-hearing child is integrated into a regular class, it is usually better if his classmates are told about his handicap.

T F 18. A sensory-neural loss is a temporary impairment resulting from infection or wax build-up in the ear.

T F 19. After a little instruction, a classroom teacher should be able to do simple repairs on a hearing aid.

T F 20. The hard-of-hearing child should be encouraged to check with the teacher whenever he is unsure that he has understood.

T F 21. Congenitally hard-of-hearing and deaf children often have a natural aptitude for visual tasks like lipreading.

T F 22. Even with the best of teaching, the hard-of-hearing child will have a limited vocabulary compared to his normally hearing peers.

T F 23. If a hard-of-hearing child doesn't understand, the teacher should repeat the same thing louder and more slowly until he does understand.

T F 24. Visual aids should never be used because hearing impaired children need to learn to concentrate on auditory cues.

T F 25. The hard-of-hearing child will not be as adept at note-taking as other children.

T F 26. It is always possible to predict how successful a hearing impaired child will be in school from the extent of his hearing loss.

T F 27. Slang and idioms should not be used with hard-of-hearing children.

T F 28. If no educational treatment is provided, deafness is more likely to result in retarded language development than other forms of physical impairment like blindness or cerebral palsy.

T F 29. A hearing loss of 25-35 db (ISO) is considered moderate.

T F 30. It is helpful to the hearing impaired child if the teacher writes what he/she says on the blackboard.

T F 31. Hard-of-hearing children are more distracted by background noise than are normally hearing children.

T F 32. The hard-of-hearing child who has received good speech training should be able to lipread under any normal conditions.

APPENDIX E

ATTITUDES TOWARD THE HEARING IMPAIRED

(Questionnaire on Hearing Impairment)

QUESTIONNAIRE ON HEARING IMPAIRMENT

Teacher's name _____ Date _____

School name _____

1. Parents of hearing impaired children should be less strict than other parents.

2. Hearing impaired people are just as intelligent as normally hearing ones.

3. Hearing impaired people are usually easier to get along with than other people.

4. Most hearing impaired people feel sorry for themselves.

5. Hearing impaired people are the same as anyone else.

6. There shouldn't be special schools for hearing impaired children.

7. It would be best for hearing impaired persons to live and work in special communities.

8. It is up to the government to take care of hearing impaired persons.

9. Most hearing impaired people worry a great deal.

10. Hearing impaired people should not be expected to meet the same standards as normally hearing ones.

11. Hearing impaired people are as happy as normally hearing ones.

12. Severelyhearing impaired people are no harder to get along with than those with minor hearing impairments.

13. It is almost impossible for a hearing impaired person to lead a normal life.

14. You should not expect too much from hearing impaired people.

15. Hearing impaired people tend to keep to themselves much of the time.

16. Hearing impaired people are more easily upset than normally hearing people.

17. Hearing impaired persons cannot have a normal social life.

18. Most hearing impaired people feel that they are not as good as other people.

19. You have to be careful of what you say when you are with hearing impaired people.

20. Hearing impaired people are often grouchy.

QUESTIONNAIRE FOR HEARING IMPAIRMENT

Use this answer sheet to indicate how much you agree or disagree with each of the statements about hearing impaired people on the attached list. Put a circle around the appropriate number from +3 to -3, depending on how you feel in each case.

+3	= I agree very much	-1	= I disagree a little
+2	= I agree pretty much	-2	= I disagree pretty much
+1	= I agree a little	-3	= I disagree very much

PLEASE ANSWER EVERY ITEM

1.)	-3	-2	-1	+1	+2	+3
2.)	-3	-2	-1	+1	+2	+3
3.)	-3	-2	-1	+1	+2	+3
4.)	-3	-2	-1	+1	+2	+3
5.)	-3	-2	-1	+1	+2	+3
6.)	-3	-2	-1	+1	+2	+3
7.)	-3	-2	-1	+1	+2	+3
8.)	-3	-2	-1	+1	+2	+3
9.)	-3	-2	-1	+1	+2	+3
10.)	-3	-2	-1	+1	+2	+3
11.)	-3	-2	-1	+1	+2	+3
12.)	-3	-2	-1	+1	+2	+3
13.)	-3	-2	-1	+1	+2	+3
14.)	-3	-2	-1	+1	+2	+3
15.)	-3	-2	-1	+1	+2	+3
16.)	-3	-2	-1	+1	+2	+3
17.)	-3	-2	-1	+1	+2	+3
18.)	-3	-2	-1	+1	+2	+3
19.)	-3	-2	-1	+1	+2	+3
20.)	-3	-2	-1	+1	+2	+3

Questionnaire on Hearing Impairment

Scoring Procedures

A. Change the sign of all positively worded items, i.e. items which indicate that deaf people are not "different" from normally hearing people.

The items to be changed are: 2, 5, 6, 11, 12.

B. Obtain the algebraic sum of all the item scores.

C. Reverse the sign of the score from positive to negative, or negative to positive.

D. Add "60" to the score. This eliminates negative scores. The resultant scores run from 0 to 120.

APPENDIX F

CLASSROOM INFORMATION QUESTIONNAIRES

CLASSROOM INFORMATION QUESTIONNAIRE

Elementary Form

Teacher's name _____ Student's name _____

School _____ Date _____

1.) Student's date of birth _____.

2.) Grade _____.

3.) Class placement:
- a. regular class
- b. class for slow learners
- c. perceptual class
- d. behavioral class
- e. other _____.

4.) At what level does this child generally function in class?

- a. well above the class average
- b. somewhat above the class average
- c. at about the class average
- d. somewhat below the class average
- e. well below the class average.

5.) At what level would you say this child reads?

- a. well above the class average
- b. somewhat above the class average
- c. at about the class average
- d. somewhat below the class average
- e. well below the class average.

6.) Before this study began, were you aware that this child had a hearing problem?

- a. yes
- b. no.

If "yes" when did you first become aware of it? _____.

7.) How much difficulty do you have in understanding this child's speech?

- a. no difficulty
- b. some difficulty
- c. a great deal of difficulty.

8.) Does this child have a hearing aid?

a. yes
b. no
c. don't know.

If "yes", how much does he/she wear it in class?

a. all of the time
b. most of the time
c. some of the time
d. never.

If "c" or "d", is this because:

a. he/she is not motivated to wear it
b. the aid is often not working or is being repaired
c. both a & b
d. don't know

9.) Is English a second language for this child?

a. yes
b. no

If "yes", what is his/her native language? _____.

Can his/her parents speak English well?

a. yes
b. no

10.) Was this child born in Canada?

a. yes
b. no.

If "no", at what age did he/she arrive in this country? _____.

11.) Relative to other children in your experience, how much concern do(es) this child's parent(s) show with his/her academic and/or social progress?

a. above average concern
b. average concern
c. below average concern

12.) What major difficulties, if any, does this child encounter as a result of his hearing impairment:

_____

_____

13.) What major difficulties, if any, do you encounter in the teaching and management of this child?

_____

_____

14.) Has the child required any special assistance in the classroom?

a. yes
b. no.

If "yes", please indicate which of the following approaches you have used. You may circle more than one:

a. I give this child less individual attention to encourage independence.

b. I have assigned this child another classmate as a buddy to assist him.

c. I have seated this child in front of the class.

d. I speak more loudly than usual.
If so: is this 1. intentional
2. largely unintentional

e. I enunciate more clearly than usual.
If so: is this 1. intentional
2. largely unintentional

f. I give this child more individual attention than other children.

g. I give this child additional tutoring.
If so: is this 1. during class
2. after class.

h. I have arranged for someone else to tutor this child.
If so: is this 1. during class
2. after class.

i. Others (please describe) _____

15.) Please indicate if the child has been seen during this school year by any of the following school professionals. (Circle each one that applies and indicate if it was a single visit or is on a continuing basis).

Professional	Single Visit	Continuing Treatment
a. school psychologist	a.	b.
b. school psychiatrist	a.	b.
c. speech teacher or speech therapist	a.	b.
d. itinerant teacher of the hearing impaired	a.	b.
e. reading teacher	a.	b.
f. others _____		

ATTENTION TESTER: How long has this child been in the present program?_____

CLASSROOM INFORMATION QUESTIONNAIRE

Secondary Form

Teacher's name _____ Student's name_____

School _____ Date_____

1.) In what subject area do you teach this student?

a. Communications - languages, literature, writing, speaking.

b. Social & Environmental Studies - history, geography, economics, world religions, law, urban studies.

c. Pure Sciences and Mathematics - physics, chemistry, biology, geometry, trigonometry, arithmetic for life.

d. Business Theory - computer science, business law, accounting, merchandising.

e. Business Practice (hands on) - typing, office machines, shorthand, office practice.

f. Applied Science - drafting, auto mechanics, home economics, carpentry, electricity.

g. Art and Music - voice, drawing, graphic arts, commercial art, design.

h. Physical Education.

2.) At what level does this student generally function in class?

a. well above the class average
b. somewhat above the class average
c. at about the class average
d. somewhat below the class average
e. well below the class average.

3.) At what level would you say this student reads?

a. well above the class average
b. somewhat above the class average
c. at about the class average
d. somewhat below the class average
e. well below the class average.

4.) Before this study began, were you aware that this student had a hearing problem?

a. yes
b. no.

If "yes", when did you first become aware of it? _____

5.) How much difficulty do you have in understanding this student's speech?

a. no difficulty
b. some difficulty
c. a great deal of difficulty.

6.) Does this student have a hearing aid?

a. yes
b. no
c. don't know.

If "yes", how much does he/she wear it in class?

a. all of the time
b. most of the time
c. some of the time
d. never.

If "c" or "d", is this because:

a. he/she is not motivated to wear it
b. the aid is often not working or is being repaired
c. both a & b
d. don't know

7.) What major difficulties, if any, does this student encounter as a result of his hearing impairment:

_____

_____

_____

8.) What major difficulties, if any, do you encounter in the teaching and management of this student?

_____

_____

_____

9.) Has the student required any special assistance in the classroom?

a. yes
b. no

If "yes", please indicate which of the following approaches you have used. You may circle more than one:

a. I give this student less individual attention to encourage independence.

b. I have assigned this student another classmate as a buddy to assist him.

c. I have seated this student in front of the class.

d. I speak more loudly than usual.
If so: is this 1. intentional
2. largely unintentional

e. I enunciate more clearly than usual.
If so: is this 1. intentional
2. largely unintentional

f. I give this student more individual attention than other children.

g. I give this student additional tutoring.
If so: is this 1. during class
2. after class

h. I have arranged for someone else to tutor this student.
If so: is this 1. during class
2. after class

i. Others (please describe) _____

_____

_____

SECONDARY STUDENT'S SUMMARY SHEET

Student's name _____

School _____

1.) Student's date of birth _____.

2.) Number of credits _____.

3.) 1973 grade point average _____.

4.) Programme:
a. level 1 & 2
b. level 2 & 3
c. level 4 & 5
d. other _____.

5.) For each of the following subject areas, indicate the number of courses for which the student is integrated in a regular class.

Subject Area	Number of Integrated Courses				
a. Communications - language, literature, writing, speaking.	0	1	2	3	4
b. Social & Environmental Studies - history, geography, economics, world religions, law, urban studies.	0	1	2	3	4
c. Pure Sciences & Mathematics - physics, chemistry, biology, geometry, trigonometry, arithmetic for life.	0	1	2	3	4
d. Business Theory - computer science, business law, accounting, merchandising.	0	1	2	3	4
e. Business Practice (hands on) - typing, office machines, shorthand, office practice.	0	1	2	3	4
f. Applied Science - drafting, auto mechanics, home economics, carpentry, electricity.	0	1	2	3	4
g. Art & Music - voice, drawing, graphic arts, commercial art, design.					
h. Physical Education.	0	1	2	3	4

6.) Please indicate if the student has been seen during this school year by any of the following school professionals. (circle each one that applies and indicate if it was a single visit or is on a continuing basis.)

Professional	Single Visit	Continuing Treatment
a. school psychologist	a.	b.
b. school psychiatrist	a.	b.
c. speech teacher or speech therapist	a.	b.
d. itinerant teacher of the hearing impaired	a.	b.
e. reading teacher	a.	b.
f. other _____	a.	b.
g. other _____	a.	b.

7.) In what extracurricular activities is this student involved?

_____

_____

8.) Is English a second language for this student?

a. yes
b. no

If "yes", what is his/her native language? _____

Can his/her parents speak English well?

a. yes
b. no.

9.) Was this student born in Canada?

a. yes
b. no

If "no", at what age did he/she arrive in this country?_____

EDUCATIONAL HISTORY

Preschool

	School	Ages
Visiting Teacher		
Preschool		

Elementary

a. regular class
b. class for slow learners
c. perceptual class
d. behavioural class

Grades	School Type	Years in Grade

Secondary

a. level 1 + 2
b. level 2 + 3
c. level 4 + 5

School Type	Years

APPENDIX G

ITINERANT TEACHER QUESTIONNAIRE

ITINERANT TEACHER QUESTIONNAIRE

1.) How much time do you spend with this child per week?

_____

2.) Has this amount a.___increased: b.___decreased: c.___stayed the same since you began instruction?

If "a. increased", please indicate:

from_____to_____.

3.) Have the parents chosen to include child in this program

a._____ with Board's recommendation:

b._____without Board's recommendation?

4.) Who advised parents for placement?

_____

5.) Have the parents ever denied this child any recommended treatment? (educational; medical). (e.g. surgery, hearing aid.)

a._____yes

b._____no

If "a. yes", what kind?_____

6.) What kinds of things do you do with this child?

_____

_____.

7.) Does the teacher generally: a.___ ask you questions concerning your programming with this child? or: b.___ are you usually responsible for initiating interactions?

8.) Does the teacher: a.___ tend to follow your suggestions? or b.___ have difficulty implementing them?

APPENDIX H

PARENT QUESTIONNAIRE

INTEGRATION OF HARD OF HEARING CHILDREN

Parent Questionnaire

My name is _____, and I'm working on the research project with hard of hearing children. If you recall, the school sent you a letter about our study, and you said that (child) could be included. We have a few questions for parents, and I wonder if you'd be able to talk with me now for a few minutes?

If NO: When could I call back?

Date: _____ Time: _____

Do you have any questions about the study or what we're trying to do?

If parent asks for information about his own child, say: I don't have any information on individual children, but we're giving all our results to the school, and if you have any questions about (child) you might ask them.

Where was (child) born: _____ Canada

_____ Other _____

1. It's our understanding, from (child)'s records, that at one time she/he had
she/he had a hearing problem: Is she/he still hard of hearing?

_____ Yes

_____ No

_____ Never Was

_____ Don't Know

2. If YES: How long have you known about the hearing impairment?

Age of Child _____

Did (child) ever have a hearing aid? _____ Yes

_____ No

If YES: When did he get it: _____

(age of child)

Does he still have one? _____ Yes

_____ No

If YES: Does he usually wear it at home? _____ Yes

_____ No

3. Do you speak any other language in your home besides English? _____ Yes

_____ No

If YES: Which language? _____

Which language do you usually use with (child)? _____ English

_____ Other

_____ Both Equally

Which language do your other children usually use with (child)? _____ English

_____ Other

_____ Both Equally

_____ No Other Children

4. If there are other children: How many other children do you have? _____

5. Does (child) require any special help from you or other members of the family because of his hearing handicap, like extra help with homework, pronounciation, or anything like that? (Describe)

_____

_____

_____

_____

6. Have you talked with your child's teacher this year or been to the school (circle highest level of involvement)?

   (a) No;

   (b) Phone conversation initiated be teacher;

   (c) Phone conversation initiated by parent;

   (d) Attended school function -- e.g., parent's night, teacher interview;

   (e) Visited school on own initiative;

   (f) Visited school on own initiative on more than one occasion;

   (g) Visists the school on a continuing and regular basis. How much? _____

   Other: _____

   _____

7. Are you aware of anything special that the teacher does to help (child)?

   _____

   _____

   _____

   _____

8. Is your child getting any other special help in school?

   _____

   _____

   _____

   _____

9. Has you child ever received any professional help outside of school, such as a speech teacher or a special preschool programme? (Describe)

   _____

   _____

   _____

   _____

10. Could you have used any additional help with your child? (Describe)

_____

_____

_____

_____

11. Which of the following would you say best describes your child's speech: She/he

_____ cannot be understood by anyone

_____ can be understood only by immediate family

_____ can be understood by neighbours and friends

_____ can be understood by most people

12. Which of the following best describes what your child usually does after school or on weekends?

She/he

_____ plays by (amuses) him/herself

_____ plays (spends time) with one or two other friends

_____ occasionally plays (spends time) with a larger group, say three or more friends

_____ usually plays (spends time) with a larger group of friends

13. What other things does your child do outside of school? Does she/he take music lessons, belong to Boy (Girl) Scouts, go to a club, or anything like that? (List each one)

_____

_____

_____

_____

14. How far have you and your husband/wife gone in school?

Mother		Father:	
_____	public school	_____	public school
_____	some high school	_____	some high school
_____	graduate from Grade 12 or 13	_____	graduate from Grade 12 or 13
_____	some university, community college or other non-degree post-secondary education	_____	some university, community college or other non-degree post-secondary education
_____	graduated from university	_____	graduated from university

15. How far do you expect (child) to go in school?

_____ some high school

_____ graduate from Grade 12 or 13

_____ some university, community college or other non-degree post-secondary education

_____ graduate from university

_____ post-graduate degree

16. Do you think (child) would have been able to go further in school if she/he didn't have a hearing problem?

_____ Yes

_____ No

If YES: How far do you think she/he might have been able to go?

_____ some high school

_____ graduate from Grade 12 or 13

_____ some university, community college or other non-degree post-secondary education

_____ graduate from university

_____ post-graduate degree

17. How old do you think your child will be before she/he is able to live on his/her own? _____